THE FAR EASTERN REVIEW

ENGINEERING FINANCE COMMERCE

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遠東時報

UPLIFT OR TRADE

By George Bronson Rea

THE NEXT WAR

JAPAN'S POLICY TOWARDS CHINA

HOW RUSSIA BLOCKED AMERICAN DIPLOMACY IN MANCHURIA

THE BRITISH STRIKE

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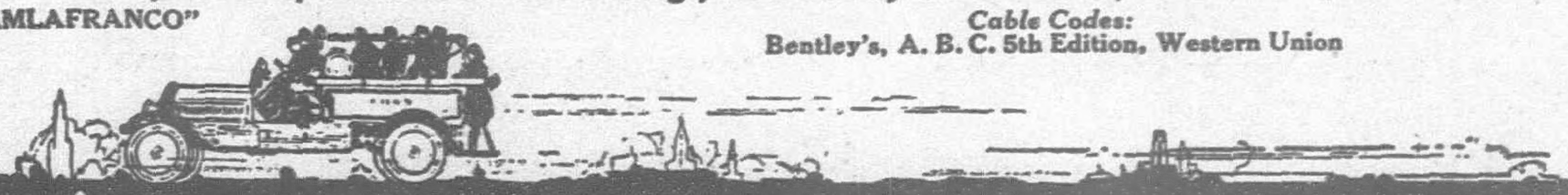

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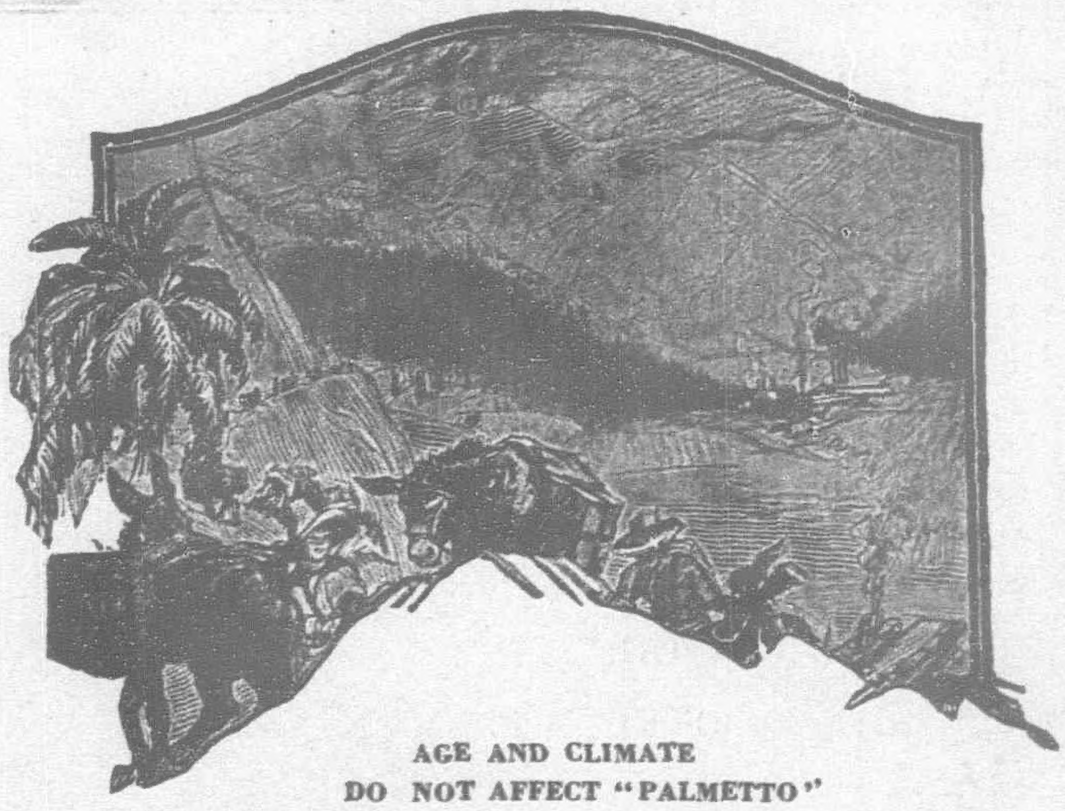

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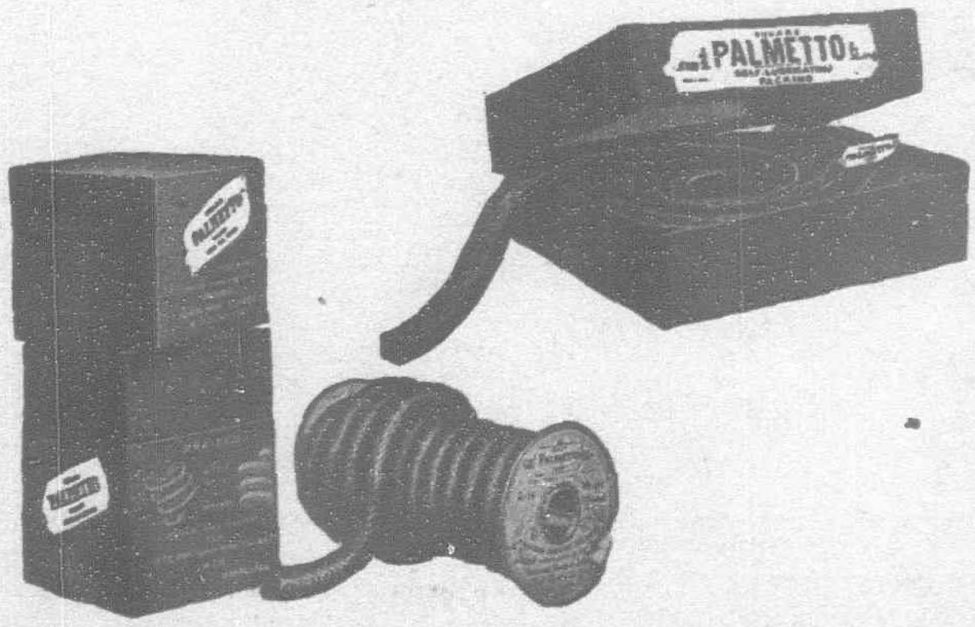

The Far Eastern Review

ENGINEERING FINANCE COMMERCE

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Uplift or Trade

American Cultural Conquest of China a Menace to Peace

By George Bronson Rea

TWENTY-FIVE years in the Far East, watching for an indication that American policy might develop along lines that would advance our material interests in this part of the world, convinces us that this will not happen in our lifetime. We have watched the inception and development of the Open Door doctrine; the acquisition of the Philippines, which was to become the distributing centre for American trade in the Orient; the organization of the original American Group, its incorporation in the old consortium and its dissolution; failure of the Simes-Carey contracts and various loan agreements which would have firmly established American prestige in China; revival of the consortium, and America's elevation to leadership in world finance; hoping that something tangible would result,

only to see our splendid opportunities disappear in a fog of platitudes about international co-operation under a leadership which shirks initiative. It has been a long and wearisome succession of mistakes, of wobbling diplomacy and unpardonable incompetency. We have heard the Open Door hymn chanted in fifty-seven varieties and our policy proclaimed in as many different chords as there are religious denominations. We have watched the procession of unsophisticated Americans prance gleefully through the portals of the Door Ajar, only to limp back, shorn, saddened and screaming for Uncle Sam to come to their help.

As the years have passed, we have seen our once intelligent trade doctrine slowly give place to a meaningless mouthing of high-sounding principles typifying our new outlook on Far Eastern affairs. The trader, the financier, the engineer, for whose benefit the Open Door Doctrine was proclaimed, have been relegated to the background, and to-day our interest in China is expressed in terms of philanthropy, of missionary endeavour and educational uplift, while the selection of our Minister to Peking is determined by qualifications that meet the endorsement of missionary boards.

Mr. Henry Morgenthau

Translated into terms of practical politics, the Open Door doctrine now means the preservation of our right to remain in business as an eleemosynary institution and maintain China as a preferred field for our cultural and religious philanthropy. This truth is not yet grasped by the American people, who, when funds are needed for new battleships and fortifications in the Pacific, are told that these additions to our armaments are necessary in the event that some other power infringes the Open Door doctrine and deprives us of the right to equal trade opportunity in China. The time is coming when the American people will want to know the truth. If our main objective in the Far East is to Christianize and elevate the moral and educational status of the Asiatic, let us be frank about it. If this is our real mission, it can be accomplished without the aid of battleships, bayonets and bullets, and in doing so adhere to the precepts laid down by the Great Teacher whose work we are doing.

Our thoughts are led into these channels after reading various interpretations of our policy from those charged with the direction of our affairs. In a conversation held last year between Governor General Leonard Wood and Edward Price Bell, which was given wide publicity in the American press, Wood, with intensified earnestness, said :—

"We cannot think of this Philippine question without thinking of civilization as a whole. And civilization, to us, is Christian civilization. We are a stone, if not the keystone, of the arch of Christian civilization in the Pacific. Filipinos, as to all but a tenth of the population, are Christians. Christianity's humanizing influence shows in their faces and is recorded in their steady moral advance. Paganism and non-Christianity can be broken down only by the impact of spiritual and cultural influences, and these will be projected from the base of a highly-developed Christian Philippines, as they cannot be projected from the distant bases of America and Europe.

"America in the Philippines, in other words, insures the effective deployment of Christianity for the regeneration of the world. These are solemn obligations and great opportunities. We can be false to them only at the cost of treason to that faith which we believe to be essential to the highest human development. Let us go out of the Philippines only when we can leave the torch of that faith in strong hands. If we, and those who believe as we believe, can Christianize the world, in the full psychic and ethical sense of that phrase, we shall rid it of injustice, of human degradation, of social cleavage and conflict, and of international slaughter. I attach immense importance to developing the philippines as Christianity's great peaceful outpost in the Pacific."

General Wood knew when he made the above statement that Christianity in the Philippines is the direct and sole result of four centuries of earnest endeavour and sacrifices on the part of Catholic missionaries. When he speaks of developing the Philippines into Christianity's great outpost in the Pacific, he means an outpost of the Church of Rome. So, if paganism and non-Christianity in Asia are to be troken down by the impact of spiritual and cultural influences projected from the base of a highly Christianized Philippines, the force will be exerted by the dominant religion in those Islands. Accepting this viewpoint, let us see how this aspect of our Far Eastern policy works out in practice.

The "Basic American" Interested

Let us turn to the autobiography of Mr. Henry Morganthau, entitled, "All in a Lifetime," to get the proper angle on the real influences operating behind the screens at Washington to direct our China policy. Mr. Morganthau is a New York banker who, at the personal request of Wilson, accepted the chairmanship of the Democratic Finance Committee in 1912, and did his work so well that, when Wilson walked into the White House, he entered without obligations expressed or implied to any man for any money that had been contributed towards his election. What followed, is told by Morganthau in the following words :—

"In April, 1913, Senator O'Gorman telephoned me from Washington that he had been requested by the President to offer me the Ambassadorship to Turkey. I apparently astonished him when I told him to please thank the President for me, but I would not accept. O'Gorman, whom I had known for many years, urged me to come to Washington to discuss the matter with him. He said I had no right to refuse such a tender over the telephone. I complied with his request, and we discussed the matter one evening until well past midnight. O'Gorman used all his persuasive powers, and told me that it seemed strange that I, an entire newcomer in politics, without ever having rendered any other political service, should have the temerity to decline to be one of the President's ten personal representatives, in the capacity of Ambassador at one of the important courts of Europe. He told me that the President was very much disappointed at my decision : and urged me to see him personally, and explain to him my reasons for declining. He said he knew the President was very anxious to avail himself of my services and thought it ill-advised for me to refuse to obey what amounted to a command from the head of the Government. I called on the President, and he said :

"'I want you to take the Embassy at Constantinople. I am convinced that the two posts that demand the greatest intellectual equipment in our representatives are Turkey and China. Therefore, I am particularly concerned to have, in these two countries, men upon whom I can absolutely rely for sound judgment and knowledge of human nature. This is the reason I am asking you to take the post at Constantinople.

"'If that is the situation,' I replied, 'I should much prefer China, although it is only a ministership. And for this reason : the Jews of this country have become very sensitive (and I think properly so) over the impression which has been created by successive Jewish appointments to Turkey, that that is the only diplomatic post to which a Jew can aspire. All the Jews that I have consulted about your offer have advised and urged me to decline it. Oscar Strauss has been criticized by some of his co-religionists for accepting a second, or even a third appointment to Constantinople. I don't mind criticism, but I share the feeling of the other Jews that it is unwise to confirm an impression that this is the only field for them in the diplomatic service.'

"Mr. Wilson's reply was aggressive in manner, and almost angry in tone.

"'I should have hoped,' he said, 'that you had a higher opinion of my open-mindedness and freedom from prejudice than this. I certainly draw no such distinctions, and I am sorry that you should have thought so. I think you will agree with me when I give my further reasons for this choice. In the first place, Constantinople is the point at which the interest of the American Jews in the welfare of the Jews of Palestine is fccussed, and it is almost indispensable that I have a Jew at that post. On the other hand, our interests in China are expressed largely in the form of missionary activities, and it seems quite necessary that our Minister there should be a Christian and preferably a man of the evangelical type ; and I am sincerely anxious to have you accept Turkey.'"

In plain words, Wilson was telling Morganthau : "How can I send a Jew as American Minister to Peking where his first duty is to look after and protect the interests of Christian missionaries and educators ?"

Now comes Colonel House in his Intimate Papers, and gives the other side of the story. Some months prior to Morganthau's, interview with the President, Colonel House suggested his name for the post in Turkey. As Turkey in Europe seemed about to disappear as the result of her defeats administered by the Balkan League, Wilson replied, "There ain't going to be no Turkey." "Then let him go and look for it," said House.

Under date of January 31st, 1913, House's diary contains the following item :

"Mr. Bryan came over in the evening and we had another political talk. He was much distressed when I told him that Governor Wilson had offered the Chinese mission to Dr. Charles W. Eliot. He thought it the poorest selection that could be made, for the reason that Eliot was a Unitarian and did not believe in the divinity of Christ and the new Chinese civilization was founded upon the Christian movement there. I asked him to state his objections in writing, not only as to Dr. Eliot, but as to any member of the proposed cabinet. I said as far as Eliot was concerned, it was too late ; but I did not believe Dr. Eliot would accept, for he had told the Governor that he would take it only if his wife approved and he was afraid she would not. Mr. Bryan was hopeful she would not."

Again later on, we find this interesting statement :—

"When it came to the more important diplomatic appointments, Wilson appealed constantly to House for information and advice. At one moment the President commissioned him to discover an applicant's attitude on religion, as he was being considered for China and the President wanted to know whether or not he was an orthodox Christian, (an interest on the part of Wilson dictated by Mr. Bryan's insistence that none but an orthodox Christian could be appointed as Minister to China). House undertook the delicate task, and the following day put the presumptive candidate through an examination on religious principles. "He did not seem to have any worth while," recorded the Colonel, and the appointment was not made."

We wonder who it was ?

House evidently had a hard time finding a deserving democrat for the Peking post, one who would measure up Bryan's idea of what constituted an orthodox Christian and at the same time meet with the approval of the missionary bodies. He evidently had finally to accept Bryan's candidate, a college professor with a single-track mind, whose diplomatic activities terminated by an appeal to Wilson to force a showdown with Japan. Morganthau, the financier, the business man of high ideals and integrity, a type that the Peking post has been crying for for the past two decades, was buried at Constantinople because he was a Jew. One of the greatest college presidents that America has produced, an intellectual giant, superior even to Wilson, was disqualified because he was a Unitarian. What would have happened had a Catholic applied for the post, is better left to the imagination.

These disclosures tell us in so many words that Jews, Catholics, Unitarians, Mormons and other good Americans who profess creeds at variance with the religious principles of our major Protestant missionary boards, can never be appointed to the post of American

Minister to Peking. At least this is the impression one receives after reading the evidence of House and Morganthau, an impression that must, in the very nature of things, set American Catholics and Catholic powers of Europe furiously to think. For although it may be true that the most important higher educational institutions in China have been erected, equipped and endowed by the contributions of Protestant missionary societies, it is equally true that the " new Chinese civilization " is as much the outgrowth of Catholic missionary enterprise as that of any other creed. Perhaps even more so. There are probably as many Chinese converts to the Catholic faith as there are to any other church, but we hear less about them, due to the simple fact that the Catholic missions and their auxiliary institutions in the main are self-supporting and not maintained by constant church contributions and money-raising campaigns indulged in by interested college presidents of other faiths. The disclosures published last year in *The Saturday Evening Post*, describing the methods employed by at least one successful missionary-educator in raising funds for his institution in China, are almost sufficient to discredit the whole movement.

The Catholic

French, Belgian and Spanish Catholic fathers were laboring in the Chinese field long before their Protestant colleagues made an appearance, laying a foundation which those who came after have built upon. These modest Catholic missions may not have achieved spectacular results along cultural lines, nor has their work received such generous publicity, but that they have contributed largely towards the establishment of elementary schools, vocational training and purely humanitarian work for the relief of the poor, the lowly, the afflicted and the outcast, cannot be denied. If all American missionaries were forced to live and do the Master's work under conditions such as we have found in several humble charitable institutions scattered throughout China conducted by Catholic fathers and sisters-of-mercy paying their way from day to day by the products of their own toil, perhaps there would not be so many of our nationals engaged in high-sounding uplift work in this country, nor would we hear so much about the American conquest of China through education.

The moral to this situation seems clear. America's Far Eastern policy, as interpreted in Manila by General Wood, comes into sharp conflict with that same policy as laid down at Washington by the Wilson administration. One nullifies the other, and exposes our government to serious criticism from loyal Catholics who are justified in resenting the imputation that they cannot be trusted with the conduct of our diplomacy in a country where the interests of their faith are as important, if not more so, than those of Protestant denominations. To confirm the impression that no Catholic or Jew need apply for a post of minister to China would not only be contrary to the principles upon which our state is founded, but politically dangerous to any statesman who might even remotely suggest it. Yet this is exactly what Bryan and Wilson did when they held the reins of power. Contrast this bigoted and narrow-minded conception of democracy with the spirit that elevated Disraeli, a Jew, to the premiership of England and leader of the most conservative and most aristocratic party in the world. Compare this exhibition of religious discrimination against the Jew in politics under a president who sent the nation to war in order to make the world safe for Democracy, and the real domocratic spirit of government that appointed Earl Reading, another Jew, to the Viceroyalty of India, the most exalted position in the British Empire, next to the Throne itself.

It is to be hoped that the precedent established by the last administration is not to be a permanent policy of our government, yet Professor Reinsch was succeeded by Mr. Charles R. Crane, more concerned with his philanthropies than with diplomacy. He was followed by Dr. Jacob Gould Schurman, a university president and experienced diplomat, both excellent men, yet the impression remains that their appointment was dictated by the same educational and missionary influence that swayed the decisions of Wilson and Bryan. The present incumbent at Peking has been trained for the post and is by far the best qualified man in our Foreign Service that could have been appointed ; the exception that proves the rule.

It has been brought forcibly to the attention of American commercial bodies in China that, no matter how able their minister may be or how sincerely desirous he is to protect and advance their interests, his hands are tied at all critical junctures by instructions from Washington bearing the earmarks of having been inspired by the element controlling our major national enterprises in China. With the vast political power of the churches behind it, this element exerts, perhaps unconsciously, an influence at Washington, that no President, statesman or politician would dare to antagonize. The successful development of their plans can be attained only by maintaining a sympathetic atmosphere in America towards China, for should popular opinion change and become hostile, it would automatically shut off the stream of voluntary contributions upon whose continuous and increasing flow depends the very existence of the movement. Adequate protection of American trade rights that might involve the use of force or severe diplomatic pressure and so create an anti-American sentiment in China or an anti-Chinese opinion in the United States, must necessarily be highly prejudicial to the success of such a movement, and while we do not insinuate that actual pressure is brought to bear in order to shape our government's policy, yet we do insist that the subconscious reaction of Washington to the desires of our uplift organisations is one of deference and subservience, if not of actual fear. The effect on a trade programme that calls for firm diplomacy is such that every American diplomat appointed to the Peking post sooner or later loses the confidence of his nationals engaged in advancing our material interests in the country.

The Source of all Troubles

The effect of this policy on the general international programme which looks to America for leadership, is seen in the present tendency to placate the Chinese by surrendering extraterritoriality and those other safeguards deemed essential for the protection of foreign lives and properties in the treaty ports and in the interior. It is not going too far to assert that the present unrest and anti-foreign agitation have their origins in the movement for elevating the cultural status of the Chinese. In fact, every close student of Chinese affairs traces the present outburst of anti-foreign sentiment to the emotional hysteria set in movement by overzealous missionary and educational uplifters. The most recent books on China, written by " Putnam Weale," Rodney Gilbert and H. G. W. Woodhead, all competent observers, are unanimous on this point.

It is not difficult to see where all this is leading to. The Chinese will follow in the footsteps of the Turks and as soon as the " unequal treaties " are denounced, one of their first steps will be to nationalize all educational institutions under Chinese direction. The great movement for the conquest of China by education, for elevating a pagan civilization to the plane of Christianity, which has cost America so many millions, will become the instrument for its own destruction. For it is difficult to believe that a self-conscious Chinese government proud of its own racial traditions and aspiring to equality with the great Powers of Europe, will consent to its principal educational institutions remaining under the protection of a foreign government. A stabilized Chinese government will revive its own form of state religion and take steps to terminate the insidious cultural and religious conquest of its people by any religious denomination protected by a foreign government, no matter how friendly or disinterested it may be. The most effective argument advanced by China in her claims to a permanent seat in the Council of the League of Nations is based on its own culture, civilization and racial virtues, so it is folly to believe that after all these centuries she will now depart from her traditions and accept the " new civilization " forced upon her under the protection of treaties which, to date, she has been too weak to denounce. The sacrifice of America's trade policy to uplift hysteria will not only end in bringing about its own collapse but will drag with it the interests and enterprises of other nationals whose investments have developed the country under the guarantees of existing treaties.

The Dog in the Manger Policy

Our leadership is therefore hardly conducive to enhancing our national prestige in countries like Great Britain and Japan, whose huge investments in China will be placed in jeopardy. European comment on this angle to our Far Eastern diplomacy is at once instructive and illuminating. America, they say, will not co-operate through the League of Nations for preserving the peace of Europe, for fear of becoming involved in a war in which it has no direct interest. America will not tolerate European interference

on the American continent, yet the Latin American states, members of the League, can and do interfere with Europe's highest plans for a solution of its problems. In the Far East, America reverses the above policy and insists upon international co-operation, forcing through in the consortium and the Four-Power Pact what was freely interpreted by its American champions as a Far Eastern League of Nations. While refusing to become a party to any "entangling alliance" that will ensure world peace against the menace of a European misunderstanding, America has freely committed herself to an alliance for preserving peace in the Pacific where her own interests seemed threatened. America will not go to war for Europe, but apparently will fight at the drop of the hat for China, which, stripped of superfluous verbiage, signifies that she will go to the extreme for the privilege of implanting in that country her political, religious and cultural ideals.

Periodically, the agitation is renewed in the United States in some form or other for additional armaments, new cruisers, fortifications in the Pacific or a huge air fleet, and the argument advanced on each occasion to justify the expenditure has some bearing on the necessity of defending the Open Door doctrine in China. Now, the one power which has consistently violated China's integrity and flouted the Open Door principle, is Russia. The one nation which has preserved China's integrity and the Open Door principle at great cost to herself, is Japan, yet America will never fight Russia in order to protect China against her encroachments. In fact, Russia may annex half the Chinese Republic and menace the very economic life and independence of Japan, and America will place obstacles in the way of Japan's defending herself. Let Japan make on move that may even remotely suggest an infraction of China's sovereignty and America will growl and get ready to bite. Russian policy has a free hand to operate in Asia without regard to a principle held sacred where Japan is concerned. So when American jingoes ask for appropriations destined to protect our trade rights in China, it is Japan they have in mind as the hypothetical enemy.

Our armament enthusiasts have learned nothing from the causes which led up to, and precipitated, the Great War. They are rushing headlong towards the same inevitable catastrophe, inciting fear in the hearts of the Japanese, forcing them to prepare against the possibility of attack. Yet we hear no nation-wide protest from our missionary and educational bodies against a programme which, if carried to its logical conclusion, will stand in the pages of history as an indictment against their own activities. For war in the Pacific arising out of any alleged impairment of America's trade right in China, simmers down to a war for the protection of our major national enterprises in that country. We cannot escape from the truth of this statement. Responsibility may be shirked and the nation maintained for a time in ignorance of essential facts and even railroaded into war on a wave of emotional sentiment, but the American people will learn the truth eventually.

Trade the Thing

The time is not far distant when the American outlook on Far Eastern affairs must be changed. We must return to the solid foundation of the trade principles involved in the Open Door Doctrine, and if this doctrine be in danger of violation by Russia or any other European power, we must in all fairness be prepared to defend it in the same spirit as we have shown whenever it seemed to have been menaced by Japan. Cultural and spiritual uplift work in China should stand squarely on its own bottom without preferential protection by our government to the work of any denominational college or religious creed. We cannot mix trade and sentiment. The sooner this truth is grasped by our missionary and educational organizations and reflected by Washington in a radical modification of our Far Eastern policy, the better it will be for America, for China, for Japan, and the peace of the entire world.

* * *

Chinese Engineering Society

THE Chinese Engineering Society with a membership of more than seven hundred modern engineers in foreign countries and native colleges has announced its plans to establish an engineering testing laboratory and library. A campaign designed to raise $5,000 from members of the Society, friends private and public organizations interested in the development of China's engineering industries to finance these projects, has been started in Shanghai, Tientsin, Peking and other important cities.

Complete plans for the establishment of the testing laboratory and library have been submitted by the Chinese Engineering Society to the China Foundation for the Promotion of Education and Culture (which is disbursing the remaining portion of the American Boxer Indemnity) for its consideration. At the next meeting of the Foundation which will be held in the near future these plans are expected to be brought up for general discussion at which time the Foundation will pass on the appropriation asked for. Individual trustees of the Foundation have pledged their support and the Chinese Engineering Society looks forward to favorable action by the Foundation.

Aside from the appropriation asked for from the China Foundation for Education and Culture, many private and public organizations in engineering industries will be asked to make contributions. These plans have already received the support of the Chinese General Chamber of Commerce in Shanghai and Chamber of Commerce in other cities of China. Many prominent industrialists and business men have pledged their support as well as many educational institutions. The Engineering Laboratory will conduct all kinds of engineering research. It will undertake to study all Chinese engineering materials and to investigate their sources of supply. The results of such investigations will be fully published by the Society. The Laboratory proposes to co-operate with manufacturers and engineers to study and improve engineering and industrial methods. Products turned out by manufacturing concerns can be submitted to the Laboratory for testing and if the quality is found satisfactory, certificates will be issued to that effect.

Realizing the need of a library where the engineers may go to consult technical books and periodicals, the Chinese Engineering Society started several years ago to make a collection of such publications. Members of the Society have contributed many books from their own libraries for this purpose, and a small library has already been established in Shanghai by the Society. It is now proposed to enlarge the existing library.

The Society was founded in 1917 by a few Chinese engineers studying in American colleges and working in different commercial institutions in the U.S A. with the object of promoting engineering education in China and carrying on engineering research of Chinese natural resources for the development of China's industries. Two years later a number of charter members returned to China, and established the head office in Shanghai. In 1922 the first Engineering Convention of the Chinese Engineering Society in China took place in Shanghai, at which the constitution of the Society was amended to meet the needs and conditions of China At present the total membership of the Society amounts to more than 700. Besides the engineers graduated from American colleges, many engineers graduated from technical schools in China, Japan, and Europe have been recruited.

The Society has been incorporated with the Ministry of Education in Peking and recognized by the Chinese Government as a legal body. Branches have been established in Shanghai, Tientsin, Peking, Tsingtao, and other cities in China Branches in America are still being maintained.

Annual conferences have been held both in China and the U.S.A. A complete bibliography of American, French, English and German text books on all engineering subjects has been compiled, to be used for the contemplated project of establishing an engineering library. Complete Chinese terms pertaining to the field of electrical engineering have been standardized and terms of other branches of engineering are in the course of standardization. Monthly, quarterly, and annual magazines have been published containing articles on engineering subjects of special interest to China. Engineering text books for the Chinese technical schools have been published and more are in course of preparation by some of the members.

The members have started a number of national engineering enterprises. Many are serving as engineers and superintendents on railways and in industrial plants. A large number are engaged in teaching. Members have also rendered consulting service to Chinese industrialists in their selection of raw materials and operation of industrial plants. Members, in addition, served as advisers to and judges at the Chemical Exposition held by the Chinese Chamber of Commerce in Shanghai in 1923.

The Next War

The Population Problem in Europe: Need for Outlets

Coolidge Can Undo the Mistakes of Wilson

A Call for a Conference

By Geo. Bronson Rea

FOREWORD: The War to end War gave birth to the League to enforce Peace. The League became part of the Paris Piece Treaty and started its peaceful career by carving the map of Europe into pieces at the expense of the most rapidly multiplying people in the world, transferring their most desirable colonial outlets to the two Powers who had the least need for them. But neither the War, the Peace, nor the League, has brought any nearer a solution of Germany's fundamental problem. The German people are still prolific, increasing at a rate perhaps greater than before, but with this difference; their colonies have been mandated to others, the doors of Allied countries are closed to them and America has clamped down the lid on immigration. They have no outlet in lands where a white man can thrive. There is only one relief in sight for the Teutonic people; if their Western outlet is blocked and they cannot spread out overseas, the current will swirl around within its present confines until it breaks through and forces a new channel towards the east. Up to a month ago it looked as though the "Spirit of Locarno" would force an opening in the Western Dykes; blocked at this point, for the time being, the current is now cutting its way towards the East and unless its force in this direction is diverted at the September meeting of the League, the recent treaty between the Soviet and Germany will open the sluice gates for the Teutonic flood to spread over the vast spaces of Russia and Siberia. Someday, in some way: the Piece-Makers of Paris will again rue the day they dammed up the Teutonic stream at its source.

In the distribution of the pieces at Paris the one Allied Power which failed to receive its proportionate slice of territorial pie, was land-hungry Italy. Wilson even tried to deprive her of this mouthful and she had to cry loud and long and threaten to spoil the party before receiving the miserable small portion handed out to her. Italy swallowed her plum with one gulp and began yelling for more. As neither of her old companions-in-arms seem disposed to share or relinquish a crumb of their hodge-podge assortment of indigestible dessert, Italy now shakes her fist at them and yells; "If you Big Bullies don't give me some more, I will take it, if not from you who are stronger then I am, then from some one who is weaker."

On the other side of the world is a tight little Empire teeming with a prolific, hard-working, peaceful people increasing at the rate of 700,000 a year. In another twenty-five years there will be 100,000,000 Japanese. The doors of the white nations are closed to their immigration. The people of Japan must perforce remain at home, absorb their increase in industries, practice birth-control, or, follow the lead of Italy and prepare to fight for their right to exist. The war gave them one chance for finding a solution to their pressing problem and they clinched it. The Allies gladly promised in return for their assistance that they would succeed to the German rights in the Chinese province of Shantung, a promise given before either China or the United States entered the war. Although Wilson was forced to recognize this claim in order to save the League, the American Senate refused to sanction it. Now Japan did not want Shantung as a colony or closed preserve for her trade. She was honest when she gave her word to restore the province to China. She did, however, want her position in Manchuria firmly established, a position she had legitimately won by fighting two wars, in the first of which she had been denied the fruits of victory by European intervention and in the second by secret diplomacy. By all recognized laws of warfare Manchuria belonged to Japan. Had Japan been permitted to return Shantung in her own way, the Manchurian question would have been permanently settled and one more menace to world peace eliminated. China's refusal to permit this direct transfer has sown the seeds of another war, a first fruit of the Peace that was to have ended all wars. America's support to China deprived Japan of this last opportunity of finding a legitimate and honorable solution to her fundamental problem and is responsible for whatever Japan may have since done to preserve her position in Manchuria through direct or indirect support to its super-warlord, Chang Tso-lin. Out of a mistaken idea of the issues involved, America has since made it her business to block Japan's legitimate aspirations at every step. Our diplomacy is operating in the Far East along the identical lines that led to the Great War in Europe. As Britain and France stubbornly opposed every attempt on the part of Germany to find suitable colonial outlets for her surplus millions, America is now sitting astride Japan's safety-valve, confining the internal pressure to its own sphere. America has learned nothing

From a drawing by Johan Bull in *The Forum*.

THE DUCE
BENITO MUSSOLINI

"We are a Prolific People and Intend to Remain So! Breed me more Sons and I Will Conquer for You a Roman Empire as Powerful as in the Days of Augustus"; he Cries to the Italian Mother. "Italy Rejects the Craven's Doctrine of Birth Control and Race Suicide while Other Nations Hold the Fertile Waste Spaces of the World as Future Feeding Grounds for their Unborn Spawn. We will Fight for our Right to Exist"! he Tells the World in Defiant Tones.

from the lessons of Europe. Wilson's meddling in European affairs at Paris intensified the fundamental problems of Germany and Italy and destroyed the one legitimate hope of relief for Japan. Germany is now looking forward to regaining control over her lost colonies through becoming a member of the League. If refused these outlets, she will find them in Russia. Italy is preparing to fight. For the present, Japan is hamstrung. The racial issue, however, is only postponed. In the meantime, the fundamental problem is once more menacing the peace of Europe, and the wiseacres talk about disarmament and economical conferences as a means of staving off the inevitable. If President Coolidge would call an international conference to devise remedial measures for the relief of overpopulated countries he will undo the mistakes of Wilson, establish world peace on a firm basis for another half century and bring hope to millions whose outlook on life is now clouded by the dread of war. There can be no lasting peace while whole nations of virile fighting peoples are bottled up in restricted areas while other nations enjoy exclusive possession of the waste spaces of the world and seek through the League of Nations to perpetuate their control. The people doomed to practice birth-control while others are holding the fertile waste spaces for their own future surplus or for preferential trade advantages, will fight for their right to exist. All the peace treaties, disarmament pacts, leagues to prevent war and other expedients of preserving the present territorial *status quo* will not hold them in check.

It is remarkable how many writers on these racial, population and sex questions take it for granted that the Japanese, Italians, Germans and other peoples confronted with the problem of over-population will meekly accept birth control or some other self-denying expedient to regulate their incerase, without fighting. God knows how they get that way, unless as we suspect they are simply reflecting their own effeminate or pacific tendencies, or, indulging in a national propaganda for the purpose of reconciling the less fortunate peoples to their fate. As we have pointed out in other articles it is difficult at times to understand just where propaganda begins and ends and as the German philosophers, professors and moulders of opinion skillfully prepared the national mind for world conquest, so perhaps British writers in order to ward off the coming conflict, are educating the mass mind of the world to accept birth control as the proper solution to a problem that will solidify their own racial future. It may work with people like the Dutch, the Scandinavians, the Swiss and other small nations who cannot help themselves, but do they seriously believe that virile, fighting nations with forty million or more inhabitants will passively accept a remedy which condemns them to permanent inferiority? Do they think that when the test comes for America, the time not so far distant when our sons will be forced out of the country to seek the opportunities denied them at home, that we are going quietly to submit to fate?

Mussolini is doing exactly what the red-blooded Anglo-Saxon would do if called upon to choose between birth-control, with all that it implies, and the right to breed and compete with other peoples on equal terms in the struggle to maintain life and perpetuate the species.

Let us reverse the conditions. If the United States were placed in a position similar to Italy, and Mexico and Central America, our nearest outlets, were protectorates or colonies of some European empire and closed to American colonization and development in order to preserve these lands as reservoirs for negro or *mestizo* armies to make good the fighting shortage in some European country practicing birth-control to a point where its own population is steadily diminishing while its next door neighbor and traditional enemy is doubling its numbers in fifty to sixty years; if Americans felt that these black armies would some day be used to invade their country and dictate terms that would confine them forever within their own boundaries and condemn them to race suicide; if Mexico and Central America were preserved in an undeveloped state in order that their productive lands might serve as future feeding grounds for the unborn spawn of their European overlords, while millions of young men in the United States were out of work, with no hope of immediate employment and with no prospect of migrating to other lands in a temperate clime where they might survive in the struggle to exist; if these lands in Mexico and Central America were developed under immigration laws which excluded the entrance of Americans in order that some European nation might be assured of raw materials that would enable them to underbid us in the markets of the world with their manufactured products, thus tightening the noose around our neck; if, in the face of these conditions, we were told that the stability of a League of Nations, the future of European civilization and the permanence of world peace depended upon our meek acquiescence in a doctrine which perpetuated the above situation, and we saw ourselves condemned to sterilize our women, subject our males to "vasectomy" and regulate our fecundity while other more favored peoples were privileged to exercise and enjoy their full power of procreation; what would be the answer of the He-American to this challenge to his Manhood?

Undoubtedly, there would be thousands of Mollycoddles, Old-Ladies-Dressed-up-in-Men's-Trousers, Too-Proud-to-Fight Idealists, Senile Professors, Long-Haired-Youths, Sissies, Mongrels, Throw-Backs and Hermaphrodities who would take it laying down, but if we understand our kind, the descendents of those hard-fisted, red-blooded adventurers and pioneers who wrested the land from the savages and the wilderness, the real American typified by Roosevelt (and who still predominate) we will fight to the last man rather than submit to a doctrine which dooms us to ultimate extinction. Mussolini, the Leader of New Italy, speaks in a voice intelligible to the virile American. More Power to Him!

Italy and Japan are now up against the same situation. Every possibility outlined above applies with equal force to their problems. If Americans will study these problems dispassionately, we will see that their problems have been intensified and complicated very largely as the result of our own idealistic policies at Versailles and their subsequent repudiation by the Senate. It is none of our business how the rest of the world solves their problems, as long as it is not done at our own expense. History will not hold us guiltless if another catastrophe is precipitated as the result of our mistaken idealism projected into world affairs. If we are honest in desiring peace, let us lend our influence to remove the fundamental courses that make for future war, Peace, for the next hundred years, will follow automatically.

The Right To Exist: Will Italy Fight?

Paris, May 1st. :—At a session of the Preparatory Committee for the Economic Conference of the League of Nations to be held in Geneva in May, the Italian delegate said that there were **more than three milion young Italians for whom work cannot be found at home** and unless immigration restrictions were removed in other countries a dangerous situation would be created.

This background throws into bold relief the paramount problem of Italy and explains the jingoistic and disquieting utterances of her statesmen and publicists now alarming Europe.

"We are hungry for land because we are prolific and intend to remain so," declared Mussolini on the eve of his departure for Tripoli. There is no suggestion of race suicide, adoption of birth control, or meek submission to fate in this explicit statement. **"We are a Mediterrenean people and our future lies on the sea"** he told his audience on the battleship Cavour. Years ago, the ex-German Kaiser, "the Admiral of the Atlantic" used the same words to excite the imagination of a people faced with the same problems. Convoyed by fifteen war-ships a demonstration of Italy's increased power in the "the Roman Sea," the *Duce* then journeyed to Tripoli to repeat there to other enthusiastic gatherings his ringing appeal for national expansion.

"We must have an army sufficient as a shield and lance. The times are uncertain and one must be prepared and ready. The times are singularly propitious for the resumption of our military activities, propitious for us soldiers and for all Italians worthy of the name. Vittorio Veneto is not a goal but a starting place for other goals," Mussolini told the senate in a speech asking for acceptance of the army reform bill.

The Fascist newspaper, *Il Tevere*, commenting on the present Italian "Call to Arms," says:

"We are now about to measure ourselves with those States which fancy themselves as the arbiters of history because they are rich and powerful and control the lives of the peoples. To win victory, we possess that will to prevail against any odds, which will manifest itself in memorable deeds. We must instil into Italy the consciousness of her world mission, and, after re-establishing order and destroying all hegemonies, both political and commercial, we shall have to measure ourselves with the outside world, which is already noting the signs of our new strength."

The *Popolo d'Italia* says that the national program presses for attention because Italy has not sufficient breathing space or enough land to feed and provide work for her sons. It dwells upon the country's super-abundant population and the closing of outlets for emigration and lays stress on her necessity to import grain and raw materials and the deficit in the commercial balance, all of which things, it says, are the result of not having sufficient territory to furnish the grain and produce necessary for her to live. "Italy," continues the *Popolo*, "is to-day among the great nations the one which has available the greatest number of men and the strongest suppresed energies."

Firing The Fighting Spirit

In these words, typical of the general tone of the Italian press we hear the voice of a new and united Italy, a powerful white people demanding a place in the sun in the same vigorous language used at one time by Germany and reflected in the same determined manner in international diplomacy supported by military and naval preparations.

All this talk may be blatant boasting; playing to the gallery for internal political effect; it may be, as Mussolini asserts, intended legitimately to excite the interest of the Italian people in their present colonial opportunities, but if the Italian delegate to the League of Nations Economic Conference states the facts and there are to-day over three million unemployed young Italians capable of bearing arms and no outlet for their energies, the jingoistic utterances of their leaders can only result in firing the heart of New Italy to the point when the nation as one man will demand that their right to exist be determined by the sword. On the other hand, after nourishing the colonial spirit, Mussolini may be able to restrain it from breaking out in action, but with a people already saturated with militant imagination fixed on Imperial expansion somewhere, somehow, sometime, he may have to make good his boasts or be swept aside for some other leader who will. To such a frenzy of patriotism has he fired the nationalistic spirit that the situation constitutes the most striking and most important political development in Europe since the Great War. Behind him, enrolled under his banner stand the youth of the nation to whom Mussolini represents the living incarnation of the ancient glories of Italy, the Leader who will once more carry the nation through to an imperial status.

Is it any wonder that Europe is alarmed? Should the Japanese press and responsible statesmen voice such explosive thoughts, the entire American battle fleet would be concentrated at Pearl Harbor and cleared for action while British ships of war would abandon the North Sea and hasten under full steam to Singapore and Hongkong. Japan, however, would never boast of what she intended to do. She would act first and talk afterwards.

The Old Menace Revived

The clash embraced in racial equality, immigration, the Asiatic menace, or by whatever name we wish to call it, has again come to the forefront of world politics through the necessity of Italy and Germany to find outlets for their surplus millions, while South African legislation for the purpose of segregating its Indian population is accentuating the Asiatic problem. Wilson thought he had definitely eliminated the issue from the League of Nations and international politics when he arbitrarily killed the racial equality resolution pressed by Baron Makino at the Paris Conference. This time, however, it is not an Asiatic people confronting a world coalition of hostile white nations that is demanding justice, but one of our own kind, one which supports its demands with a declared willingness to fight for what it conceives to be its right.

For the moment, Italy's declared intention to solve her problems in her own way, by force, if necessary, is by far the most menacing phase of the surcharged European political atmosphere. Nobody seems to know just where Mussolini will attempt to break through the barriers, and as a consequence, France, Great Britain, and Turkey are not only alarmed and nervous, but taking precautions to safeguard their respective interests. The sudden development of Italy's colonial program has definitely changed the drift of European politics and transferred the scene of great events from the Rhine to the Danube and the Dardanelles. With the Locarno pact and Germany's assured entrance into the League next September, the peace of Western Europe seems fairly well established for another generation, but just as soon as the old menace is removed we find the same forces which brought on the Great War breaking out in another direction under still greater pressure.

Inviting Explosions

Many reasons have been advanced to explain Germany's urge for conquest and expansion but the compelling force was the pressure of a rapidly multiplying people confined within a restricted area with no outlet in a temperate clime under their own flag where a white man could exist and thrive. It is somewhat disappointing to wade through the mazes of diplomatic memoirs and other books which attempt to explain the causes which led up to the Great War and read the stereotyped verdict that German militarism was solely to blame for the catastrophe. German militarism was but the outward manifestation of irresistable forces whose unregulated confinement ends always in disaster. The German explosion had to come sooner or later and the responsibility must in part be shared by those who sat on her safety valve and confined the pressure. Any other country placed in a similar position invites the operation of the same fundamental law. This is exactly what is happening in Italy, in Japan, though for the present the Japanese, still facing a united white opposition, are striving to regulate the internal pressure by creating industrial outlets that will act as safety valves. Japan is just now sawing wood and keeping silent watching with keen interest how the white powers will respond to white demands for more elbow room.

With a population of over 40,000,000, already larger than France, Italy is increasing at the rate of nearly 500,000 a year. France still indulges in racial suicide and reaches out for new territory for her bureaucrats to govern. Japan, with 80,000,000 people confined in a much smaller area and with no outlet, increases at the rate of about 700,000 a year. With a population equal to that of Japan, the Italians would increase at the rate of 1,000,000 a year.

Challenge To France

Since the doors of America have been practically closed under the quota system to the unrestricted entrance of immigrants, Italy has been forced to seek other outlets where her people can earn a decent living. A large and increasing number have flowed over into France and into the French possessions in Northern Africa. Tripoli, Italy's colony in Africa, is coterminious with the French protectorate of Tunis in which there are about 84,000 Italians as compared with 54,000 Frenchmen, a majority whose passive or active resistance to French colonial policy thrown in the scale with Arab discontent can cause considerable trouble for the dominant power. It is the Italians rather than the French whose labor and capital have enriched Tunis and some idea of the present state of feeling can be gathered from the fact that the French recently passed legislation for denationalizing the Italians resident in this protectorate. To say that the Italians are wroth is to put it mild. Mussolini's recent visit to Tripoli, heralded as it was with threats and boasts is accepted as a direct challenge to French supremacy in the Mediteranean, and although Premier Briand prefesses to see in these manifestations only a boiling over of spirit or a letting off of steam for purely political effect at home, the French public and press is uneasy and asking; **"how far and by what means does the New Italy intend to carry her colonial efforts on the African shores?**

They point out that Mussolini's African trip coincided with the signing of a new Anglo-Italian treaty defining the exact economic rights of each country in Abyssinia, ignoring that a treaty concluded in 1906 between Great Britain, France and Italy defined the interests of each of these powers in Abyssinia and which cannot be modified without the consent of all the signatories. His visit is admitted by Italian newspapers to have a profound significance in relation to Moroccan affairs and French pretensions to supremacy in Tangier. Something of how the Italian mind is working is seen in an article in the *Impero*, which says that **"France is wholly incapable of dealing with Abd-el-Krim and that anybody who wishes to enjoy possession of the Rif must abandon the policy of the "rights of man" and crush the Rif by force."** Looking ahead to a possible ending of the Moroccan war and the ascendency of France in the control of Tangier as a result of the peace treaty, the Italian newspapers declare

that nothing can be done without the intervention of Italy, who in 1912 defined her rights in that international zone in exchange for the abandonment of France of all interference in Libya. This resignation on Italy's part would no longer hold good should the Tangier zone fall under French influence. In other words, Italy intends at all costs to take a hand in any future discussion over the Tangier problem and thereby expand her influence amongst the Arabs of North Africa. These and other signs of Italy's new trend in world politics are beginning to create a feeling of anxiety in France, lest one day or another she will find Italy across her road in the same manner that Germany formerly blocked her at every step. In fact, for some time past, French diplomacy has everywhere found Italy placing obstacles in its path, the result of a wholesale transformation in Italy's foreign policy and the replacement of old-style diplomats by men who are defending Italian interests with energy and firmness.

Mussolini is determined to have ambassadors and ministers who, wherever they may be accredited, whether in Paris or Peking, will adhere to the new orientation of foreign policy embraced in the Imperial spirit of *Fascism*. Concern for fine juridical points and discovering elegant compromises will give place to the frank and intensive methods of *Fascismo*, an experiment in international politics which is certain to be watched with the greatest interest if not without a measure of anxiety by the older school of diplomacy.

Italy Rejects The League

It is no secret that the French and British policy of agreement in favor of preserving European peace does not correspond with Italy's ideals and is accepted by her only as a provisional measure pending the time when her own plans for action are completed.

Italy reposes no faith in the League of Nations, in fact, looks upon it as the instrument that keeps her from attaining her ideals. Speaking on the subject of the League, Signor Coppola, late Italian delegate at Geneva, stated that :

"The League is based upon an 'international falsehood'. The League to-day," he continued, "offers the spectacle of hypocrisy and fantaticism, misrepresentation and falseness, ethnical and political, and what is more, implacable theoretical disagreements and aversions, that is to say, hatred and falsehood. It is impossible to discuss international problems when the basis of the argument is false. A discussion on such a basis can only increase the hatred and distrust of peoples. The result of this may not be war at present, but when Europe has recovered from her post-war fatigue and passions are more heated, war will be inevitable" After inveiging against the Wilsonian falsehoods, upon which the League is based, Signor Coppola concluded with the "reflection that the only power capable of breaking this chain of lies and misrepresentations is *Fascismo*. Fascist Italy, in the name of her inalienable right to decide her own future, refuses the protocol of enforced peace and immobility, openly asserts the vital necessity of her Mediterrenean and colonial expansion, and breaks through, in her own and everybody else's interests, the dense fog of anti-imperialist equivocation which is inevitably heavy with the threat of war."

Nothing tame about that statement. It is reinforced by the *Popolo d'Italia* in these words :

"An obvious injustice was perpetrated at Versailles to the damage of Italy.....the false prophet Wilson, the empirical Lloyd George and the jealous Clemanceau made a grave mistake in closing to Italy the outlet towards which her energies might and ought to have legitimately swept. We are not aware how and when the injustice may be remedied. But the problem demands a solution, and as the *Duce* said, those who do not consider Italian interests and our legitimate expectations would assume a great responsibility."

In other words, the responsibility for whatever step Italy may take to expand her territories and solve her population problem rests on the shoulders of those nations whose dreams of universal peace based on an unequal distribution of world territory, have closed the door to the pre-war method of expansion by force of arms.

Activity In Eritrea

In addition to apprehension over Italy's moves in the Mediterrenean and North Africa, the French feel that Italy stole a march on them by entering into the new agreement with Great Britain in which Italy recognizes the exclusive right of Great Britain to deal with the waters of Lake Tana—the source of the Blue Nile—as provided for in the Anglo-Abyssinian agreement of 1912, while Great Britain agrees not to oppose any Italian scheme for railway development in the hinterland of Eritrea or Italian Somaliland which may affect Abyssinia. Although French interests under the tripartite agreement of 1906 suffer no impairment by the new understanding, they stand to lose by the construction of new railways, since the only one at present is French and the sea-borne trade of Abyssinia is conducted mainly through the French port of Djibuti.

The French also attach significance to the fact that while these treaty revisions were being made, vigorous Italian military operations in Italian Somaliland were started with the object of bringing all the country under direct control of the governor. Reports indicate that Italian penetration is proceeding favourably, but at the same time rumors are in circulation emanating from British sources in Kenya, that the Italian arms have suffered reverses, a report which the Italian government immediately denounced as a malicious falsehood invented for the purpose of influencing exchange speculation. The fact remains, however, that Italian colonial policy in Somaliland is once more agressive and although the operations do not menace the rights of Abyssinia, which is a member of the League of Nations, it is not difficult to understand that her present activity in that sphere has created justifiable apprehension throughout France and attracted the close scrutiny of Abyssinia.

Turkey Mobilizing For War

French alarm, however, cannot be compared to the fear inspired by Italy's movements in Turkey. Here we find all the elements for a first class explosion ready for the spark. Italian military concentrations in the Islands of Castellorizzo, Leros and Rhodes, seem to presage an attack upon Adalia and Smyrna in combination with a Greek attack in Eastern Thrace and joint naval operations. Reports, officially denied, state that a Greco-Italian pact has been concluded and that Italian factories have received orders to supply deficiencies in Greek armaments relating to aviation, light tanks, heavy howitzers and gun batteries, in addition to 100,000 rifles.

Whatever the truth about the Greco-Italian pact, Turkey is taking no chances. Angora is mobilizing and preparing for war. Six annual classes of reservists totalling about 120,000 men have been called to the colors, doubling the peace establishment and next month the grand military manœuvers will be held with over 250,000 men in the field on a complete war footing. Turkish agents throughout Europe are purchasing and contracting for large supplies of munitions and the preparatory work of fortifying the Dardenelles through the laying of vast mine fields is being feverishly pushed forward. The Turkish armies are concentrating at Smyrna, Mersina and around the railway junction of Afiun-Karahissar, prepared to resist the expected landing of the Italian forces. Angora has been privately warned that Italy might be driven to make war before Germany enters the League next September, lest when she does become a member of the League she would be tempted in the event of an Italo-Turkish war, to raise the matter in the Council in Turkey's behalf. So long as Germany had not taken her seat on the Council, Turkey being outside the League, no Council member would be likely to challenge Italy's action. In view of this situation, Moscow has proposed to Angora that Turkey shall enter the Union of Soviet Republics as an independent member in return for Moscow guaranteeing a military alliance, troops, munitions and aid for the Turks in the case of aggression. It is reported that Kemel Pasha and a strong section of party chieftains favor acceptance of this proposal. So here we have the stage set for another war which the Italians feel is made necessary by the interference of the Great Powers in matters which vitally affected their colonial ambitions. Signor Morello writing in the *Secolo* on this situation, asks ;

" If the Great Powers wish seriously to provide for the peace and security of Europe, they ought to put to themselves again, besides the problem of the Rhine and Silesia, the

problem also of the Italian colonies, and deal with it according to law and justice, both equally disregarded in the Paris treaties. Have they ever thought what has happened to the hopes held out to Italy in Asia Minor? Have they ever thought about the losses suffered by Italy in Asia Minor as a result of the disorder created in the East by their mad design to wipe Turkey off the map of Europe, thus rendering her exasperated and incapable through distrust of any longer coming to the point of making treaties and agreements, even with the Powers that were neither to blame nor responsible for the campaign against her?"

Crisis This Summer

A glance at the kaleidoscopic changes in the European political situation would seem to indicate that for the moment Asia Minor is the real goal of Italian ambitions though some new shift in the present line-up of the Powers may completely change the picture overnight. Germany recently proposed a union with Austria, which, if consummated, will prove a serious blow to Italian prestige in South Eastern Europe and menace her position in Trieste and Fiume. Italy is therefore exerting her dipolmacy to assure the most friendly relations with Jugo Slavia as the only effective counterbalance to a Pan-German bloc of 80,000,000. This new development also compels Italy to remain on good terms with France as between them they also represent some 80,000,000 inhabitants, a solid Latin block which balances the Teutonic combine. This removes from the picture the possibility that Italy will rashly forfeit the assistance and friendship of France by any move that would disturb the *status quo* in North Africa or the Mediterranean. With these possibilities for trouble eliminated, it would seem that the only hope for Italian expansion lies in Asia Minor at the expense of the Turk, a contingency that is viewed with alarm by Berlin and Moscow both of which capitals cherish dreams of their own about the future disposition of Turkish territory. Turkey being outside the League, befriended only by Russia, whatever move is made by Italy to force a landing in Asia Minor must take place before Germany enters the League, takes her seat in the Council and uses her influence to thwart the Italian program. So the crisis arising from the Italain problem of over-population may reasonably be expected to take place this summer

"William's Ape"

The moves of Italy to secure a place in the sum denied to Germany is being closely followed in the latter country. Commenting on Mussolini's speech about Italy's destiny being on the sea, the German Socialist newspaper *Vorwarts* calls him "William's Ape" and points out that his policy is bound to lead to a dangerous conflict of views with the other powers having Mediterranean interests. This newspaper admits that Italy needs colonies for her increasing population just as Germany did, and reminds Italy that had she stuck to the Central Powers during the war she sould have had all that she desired in the way of territioral expansion—if they won—whereas she could not obtain anything from the Entente, since the last thing Great Britain or France wanted in the Mediterranean was a strong Italy. The Italians, the *Voruärts*, will have reason to howl still louder than the syrens which howled at Mussolini's departure for Tripoli.

Germany's Colonial Demands

Italy's demand for colonial expansion comes at a most inconvenient time for Germany, who confidently expects to be awarded colonial mandates as soon as she enters the League. German newspapers contend that the Locarno treaty was accompanied by a tacit agreement that Germany would receive colonial mandates after entering the League as a member. This conviction is based not so much on any expressed acquiescence in her suggestions, but on the absence of any opposition of protest against her direct question. Following diplomatic usage, the German Government deems itself justified in drawing the inference that as soon as Germany enters the League there will be a redistribution of colonial mandates with Germany as one of the participants. The question, as far as Germany is concerned, is at once definite and delicate. perhaps on no question is public opinion so sensitive or so determined, that Germany shall, in some form or other, resume colonial activity at the earliest possible moment. It is unquestionable a part of the German policy towards the League, and the Government is determined at the earliest opportunity of announcing its demands for a colonial mandate and force the League to a showdown on this question.

What About Japan?

So here we have the same old question raised in the Mediterranean which only a few years ago seemed to menace the peace of the Pacific. Italy, arrogant and defiant, threatens to fight for her right to colonial expansion while Germany, disarmed, humbled and meek, seeks to gain through logic and diplomacy what she failed to conquer through the might of her armies. We hear nothing from Japan. It is none of her business. But it is a foregone conclusion that she will take a very prominent part in any discussion over these questions and if there is to be a new shuffle in mandates to satisfy German or Italy aspirations, it is needless to say that Japan will also expect the same consideration for her more vital problems.

Italy and Germany can perhaps be satisfied with some readjustment of African or Near Eastern territorial boundaries; but how about Japan? Europe will never consent to Japan holding a mandate outside of Asia or the Pacific. Japan may be staved off for the time but the day will come when some militant leader in that country will gather the nation behind him and demand from the world the same rights as are now being so loudly proclaimed by Italy.

South Africa's Anti-Asiatic Laws

Let us turn for a moment to another phase of the population problem as it is developing in South Africa, where we see a conflict between the dominant whites and a pitiful handful of friendless Indians, subjects of a great Empire which cannot intervene in their behalf for fear of inviting secession from its rule. The immigration of Indian coolies into South Africa, largely for working the Natal sugar plantations, was stopped in 1913 but not before a large number had elevated themselves out of slavery in the fields to the position of small traders and shopkeepers, settling down and raising families in the country. To-day there are about 160,000 Indians in South Africa, mostly concentrated in Natal, the majority of whom where born in the dominion. They know nothing of India, its language or customs, and if repatriated would be treated in the land of their fathers as strangers and outcasts. White South Africa voicing the same cry that finally led to the exclusion of Asiatics from the United States declare that the presence of large numbers of Indians in their midst is a peril to their standards of life and comforts, so its parliament has drafted a law known as the "Class Areas Bill" for the purpose of confining these 160,000 Indians in certain limited residential reservations.

The Imperial Government's hands are tied in dealing with this injustice within the empire, fearful that any intervention in support of its Indian subjects may provoke another outburst of independence on the part of South Africa which with Canada is already showing unmistakeable signs of breaking away altogether from the Imperial leading strings in international affairs. A debate on this subject recently indulged in between General Smuts and General Hertzog brought out the following illuminating statements; General Hertzog contended that "a free nation must recognize only one authority—the will of its own people. As far as I am concerned," he continued, "it must be clearly understood that Soutl. Africa takes its place in the affairs of the world as a nation free and on an equal footing with the rest of the world." General Smuts emphasized this view by saying, "I regard the British Empire as an organic combination of equal states..... There is no superstate, no super-authority. It is a meeting of equals under one sovereign."

Britain's Imperial Weakness

With such definitions of its status in the partnership of Empire, Imperial intervention in the affairs of South Africa by vetoing anti-Asiatic legislation in favor of its Indian wards is fraught with considerable risks. A way out of the dilemma is being sought by

the Government of India on behalf of the people confided to its care by requesting a round-table conference with South Africa with the object of finding some solution that will not wound the susceptibilities of the thinking classes of India. Notwithstanding the uncomfortable predicament the issue presents to the Imperial Government, well informed Indians declare that unless the Imperial veto is exercised, the passage of the law will result in a still further loosening of the ties which bind India to the Empire. They declare that the preservation and development of India's place as an important part of the empire deserves from the Imperial standpoint no less serious consideration than the domestic difficulties of South Africa, who invited the Indians to work its fields in the first place and then treated them as coolies unworthy of being educated or uplifted. That the Indian coolie still lives on a lower plane than the whites is due therefore, they say to the latter's own shortsightedness. For the moment the issue is warded off, pending the outcome of the round-table conference, but if this fails and South Africa enforces its anti-Asiatic legislation and the Imperial Government declines to interfere in behalf of its wards, one more kick will be administered to the Asiatic that will throw him back upon Asia in the same manner that the American Government threw Japan back upon its own continent to seek its only outlet from over-population in territories where the American Open Door and other philanthropic doctrines effectively prohibits Japan from finding relief. The outcome of South Africa's assertion of its rights to enact discriminating racial legislation against the higher interests of the Empire of which it forms an independent part, will be watched by every thinking Asiatic from Hakodate to Bombay.

The Rising Pressure

A superficial of the population and unemployment situation in Europe reveals some striking facts that tend to force this problem into the forefront of international politics at an early date, either through a friendly conference of the Powers called to devise means for regulating the pressure or, through an explosion that will precipitate war. The time must come when the right of Great Britain and France to control vast colonial territories, protectorates and mandates for the benefit of a people who will not emigrate and develop them, is bound to be challenged. The issue therein involved will bring America into the controversy in order to defend her own policies.

I have not the statistics of the French birth rate before me, but it may be said that practically the same conditions exist today as before the war—a decreasing population on one hand and a constant reaching out for new territory on the other. Before the war there were more Germans in Paris than there were Frenchmen in the French colonies. The Italians have since taken the place of the Germans in the French economic life and today there are some 3,000,000 foreign workmen in the country, the larger number coming from Italy. There are about 200 applications daily for naturalization, some 70,000 annually, a very small proportion of the total foreign influx. The prospect of unemployment on a large scale as a result of slowing down reconstruction work or a general crash following the collapse of the franc, has already been the subject of debate in the Chamber. In such a case, it is urged, French workmen would become the "victims of foreign workmen" working at a reduced wage. French industrialists realize that a period of trade depression and unemployment lies ahead and to keep Frenchmen at work they will have to dispense with a large proportion of the 3,000,000 foreigners whose manual labor has hitherto been so welcome.

Soviet Organizing Civil War In France

As the majority of these foreign workers are Italian, the immediate effect of an industrial depression in France will be to return the unemployed to Italy there to swell the enormous number of idle hands whose only hope of existence lies in national expansion. The prosperity of France and her ability to continue to provide steady work for her army of foreign laborers would therefore seem to have a very important bearing on the tense Italian situation and European peace. A crash in the value of the franc may at any time precipitate the crisis. The Soviet leaders, the only ones in Europe outside of Italy who seem to appreciate the danger, are preparing for the civil war that they confidently expect will break out in France within six months. At the recent annual meeting of the "Enlarged Executive Committee of the Communist International," Zinovieff referred to the 2,000,000 foreign workers in France who must be prepared to become 2,000,000 agitators, a frank avowal that civil war in France in being organized in Moscow.

The British Problem

Let us glance for a moment at the British problem. Here we find that unemployment has been gradually reduced to about a million and with the present depressed state of British trade there is little hope that any unusual industrial activity will materially decrease this number. The British possess the fairest lands in the world as outlets for their surplus population, but because of unemployment doles, old-age pensions, state subsidies to industries and other coddling of labor, combined with restrictions imposed by the Dominion authorities, they do not emigrate. Why should they? Their Government takes care of them in idleness. It is much better to remain comfortably at home supported by the state than face the uncertainty of life in a new land, where they must work hard in order to exist. The Empire Settlement Act authorised an expenditure in aid of migration in the years 1922-25 of £10,500,000 of which less than £1,500,000 was spent. Naturally, under the above favorable conditions, the British Government cannot drive the unemployed out of England even by offering to pay his expenses. As a consequence of the falling off in emigration and other causes, the population of the British Isles has increased in three years by over 600,000. The British Government is solving its own problems in its own way by taxing the rich to keep the unemployed contented. They can be depended to work out their problems if given time enough, but with the dangerous attitude of British labor towards capital, combined with the highly inflammatory state of affairs in Continental countries a premature explosion in Italy or France must react disastrously in Great Britian,

The number of unemployed in Germany on April 15, was 1,884,000 with a tendency to decrease gradually as industrial conditions improve. In Austria, with a population of some 6,500,000, over 250,000 are receiving the dole, with another large body of unemployed, which considerably raises this total.

This fleeting picture reveals that the two great colonial powers, Great Britain and France, are doing nothing to utilize their opportunities in solving the general population problem for the benefit of other nations whose sacrifice contributed towards the victory which established them in possession of these vast territories.

Italy and Germany, the two most prolific nations in Europe, have no outlets in a temperate clime under their own flag. Italy is saturated and has about reached the explosion point. If the internal pressure is raised at this time by a sudden influx of homecoming sons thrown out of employment in France, it is foolish for the theorists to reason that the laws of nature will operate to ward off the inevitable

It is folly also to believe that there is any love lost between Italy and France over this question or that exchange diplomatic visits denote a close and amiable understanding between the two nations. During M. Barthou's recent visit to Rome, Signor Tittoni, president of the senate, asked him frankly if France had recognized the interests of Italy and answered the question himself by an emphatic "No." He further said that the economic liquidation of the war was a complete negation and betrayal of the most elementary economic interests of the Italian people. "France," he continued, "rich in colonies, was given 922,000 kilometers of new territories with a population of over four million while Italy obtained only 80 kilometers densely inhabited." "Italian-French amity and understanding," he said, "could be maintained only by an open acknowledgement on the part of France of the grave injustice inflicted on Italy and the necessity which now confronts her of finding new outlets for her peaceful workers and the multiplication of the race."

From this standpoint, the peace of Europe hangs on a very slender thread. The issue may be averted or postponed, but it cannot always be shirked. The facts stand. The explosion may come this year or later on, but come it will, if Great Britain and France continues to squat on the safety valve of Italy in the same manner they invited the German blow-up. Another such explosion will blow Europe to perdition.

Japan's Policy Toward China

Viscount Motono's Views in 1916

ONE of the most remarkable contributions to pre and post-war European history is the series of three volumes entitled "An Ambassador's Memoirs," written by Maurice Paléologue, the last French Ambassador to the Russian Court. The third volume is of special interest to Far Eastern readers as it records M. Paléologue's impressions of Viscount Motono, his Japanese colleague who was promoted to Minister of Foreign Affairs in October, 1916. His testimony constitutes one more link in the chain of evidence disclosed in the memoirs of other highly placed Allied state officials, that during the war, Japan lived up to the highest conceptions of loyalty to her Allies once more giving the lie to those narrow-minded and prejudiced writers who have sought to blacken her character by distorting the facts. Viscount Grey of Falloden speaking for Great Britain and Maurice Paléologue, the most important of the French Ambassadors, speaking for France, have given the world the true estimation of Japan's character.

Viscount Motono's views and prophecies as to China, and Japan's future outlook on the stutation as expressed to Paléologue in 1916 are of great importance, as proving that even at that date, two years before the armistice, Japanese opinion was in regard to China was changing and that the change came from within and was not forced by the events of the war. His prophecies in regard to the Chinese situation have come true. All the foreign Powers can do is to keep China under observation and apply such remedies as the symptoms require for the next twenty years. The extract from Paléologue's memoirs follows :

Wednesday, October 11, 1916.

"My Japanese colleague, Viscount Motono, has just been appointed Minister for Foreign Affairs. Of all the Japanese I have known he is certainly the most open-minded, the best informed on European politics and the most accessible to European thought and culture. With his departure I shall lose an excellent colleague, a man who is perfectly safe to deal with and one with a remarkable all-round knowledge.

"After congratulating him I asked him about the direction he proposes to give the diplomacy of Japan.

"I shall try," he replied, "to apply the ideas I have so often expressed to you. In the first place I should like to make our help in the war more effective. That will be the most difficult part of my task, as public opinion with us does not realize the universal character of the problems which are now being solved on the European battlefields."

The Late Viscount Motono

"This pronouncement in no way surprised me as he had always been advocating a more active intervention in the European struggle ; he has even tried to persuade his government to send Japanese army corps to France and has pleaded unceasingly for the output of Japanese arms and munitions for Russia to be increased, and the rate of supply accelerated. At every stage he has adopted the most lofty views of the alliance.

"Then I asked him his intentions with regard to China. He continued ;

"What can I add to what I have already told you so often ? You know what I shall try to do —and also what I refuse to do."

"I will summarize the opinions and prophecies he has uttered in my presence on the subject of China ;

"(1) When the present struggle is over, the Chinese question will gradually take that place in the general policy of the Powers which was formerly taken by the Eastern question;

"(2) At the present moment that is not *one* Chinese question ; there are several. The problem has not yet been stated in its full import. The succession of the Chinese Empire is not open. For a very considerable time, twenty years and perhaps more, the Powers will only be able to keep China under observation ; they will have to confine themselves to applying provisional remedies to her, giving her symtomatic treatments, as the doctors say ;

"(3) The European Powers should realize that geographical propinquity, ethnical affinities and historical memories give Japan not prerogatives, but special interests in China. On her side Japan must realize that the successful solution of the Chinese problems can only be reached in Europe. If Japanese diplomacy succeeds in taking a lofty view of its task, Japan would become the instrument of conciliation between all the rivalries and antagonisms of which China is the theater. She must, therefore, renounce a policy of exclusive advantages and act as a balance, as her interests require."

"What," asks Paleologue, "will become of this wise program when it has to face the test of reality. Will not Motono unconsciously recover Japanese mentality when he has breathed his native air again for a short time ? It is a secret of the future.

Motono was successful in turning Japanese policy and as a result of his lofty conception of Japan's duty and those which followed him in the direction of her foreign program, she is now able to take her place in the councils of the nations as one of the leaders whose voice cannot be lightly set aside.

How Russia Blocked American Diplomacy In Manchuria

Isvolsky's Clever Move Converts the Six-Power Consortium into an Instrument for Protecting Russia's Special Interests in North China, Manchuria, Mongolia and Chinese Turkestan

THE FAR EASTERN REVIEW has on many occasions vigorously fought the Sino-American campaign of misrepresentation having for its object the poisoning of the American mind against Japan. Nearly every serious book on Far Eastern problems written by American or American-educated Chinese authors, condemns Japan for the breakdown of American diplomacy in the matter of the Chinchow-Aigun Railway Agreement and the Currency Loan of $50,000,000 intended in part for the development of Manchuria. We have always emphasized that the real impediment to America's theatrical invasion of a sphere that was loaded with political dynamite, was Russia. It is true that at the outset, Japan opposed the Chinchow-Aigun Railway Agreement conceded to the American Group, but that she had severe provocation has since been admitted in the biographies of Willard Straight and E. W. Harriman. Their confessions disclose that balked in his plans to create a round-the-world American transportation system through Japan's rejection of a preliminary agreement to sell the South Manchuria Railway, Harriman employed Straight while the latter was American Consul at Mukden, as his instrument to obtain from China the rights to a competitive parallel line that could be used as a lever to compel Japan to sell out. Yet even with this menace to the profitable operation of the South Manchuria Railway, Japan was ready to withdraw her protest if permitted equal participation with Great Britain and America in its financing and supervision.

On the other hand, Russia never did withdraw her protest, standing squarely on the startling and outrageous doctrine that the Chinchow-Aigun line constituted a direct menace to her strategical position on the Amur, thus establishing the international principle that whereas she was at liberty to build strategic railways terminating at various points along the Chinese frontier, any attempt on the part of China to defend her own interests by building lines within her borders, would be considered by Russia as a menace to her strategic position!

Of the many volumes of political memoirs now flooding the book stores of Europe, one of the most illuminative and instructive as showing the working of the pre-war diplomatic mind, is the correspondence of Alexander Petrovitch Isvolsky, the cleverest and craftiest of the Czarist diplomats. Isvolsky is well known in the Far East where he held the post of Ambassador at Tokyo at the time of the war with Russia. He was subsequently Minister of Foreign Affairs and then Ambassador to France in the years immediately preceding the war. The most important of his diplomatic correspondence was published by the Soviet Government in 1922, and translated into German and French. Dr. Fredrich Stieve, of the German Foreign Office, has since selected those documents pertinent to his subject for collection in a book in English entitled "Isvolsky and the World War" and the few references to China contained in the book, fully establishes the fact that Russia, rather than Japan, was the direct cause of America's failure to carry through her plans in regard to Manchuria.

The principle behind Russia's opposition to the Chinchow-Aigun railway was part of a general imperial policy which also found expression in protesting against the French negotiations for financing railways in Asia Minor. Here, according to Russia, she would have been forced to spend large sums in building counter strategic lines at a time when all her energies and finances were concentrated on strengthening her western front.

Isvolsky's letters reveal that Russia tried to destroy the original consortium, even insisting that her ally, France, withdraw from it. She only agreed to enter the Six-Power Consortium after receiving the most solemn assurances from the French Government that it would support at all times her special interests in Northern Manchuria, Mangolia and Chinese Turkestan and use its diplomacy to exert pressure on other cabinets for the same purpose. The dubious credit for initiating the principle of international co-operation in Chinese finance is claimed for America, but Isvolsky's correspondence will undoubtedly help to dispel some of our complacency. He shows that Russia only accepted the principle after she had fully safeguarded her special interests by direct promises of support and the further guarantee involved in the composition of the consortium itself, which gave the majority vote to Great Britain. Japan, France and Russia, whose interests were identical, Poincare's assurances to Moscow tells us that nothing America might have proposed had the slightest chance of going through without Russia's consent. America was caught in the trap set by Isvolsky and incapacitated for carrying out her elaborate plans for intervening in Manchuria as embraced in Harriman's scheme and Straight's subsequent moves to save the province for China.

International financial co-operation in China may be good diplomacy as applied to the present consortium and present conditions, at least, there is considerable justification for complete unity. America is entitled to very little credit however for establishing a principle, forced upon us by world finance, at a time when we were dependent upon Europe for the money to take up our participation. The American Group, in pursuit of an ideal in the formation of the original consortium, simply facilitated Russia's designs on China and preserved intact her spheres of special interest. Isvolsky's contribution to history strengthens the conviction that from the declaration of the Open Door doctrine at a time when Russia and China were in secret alliance for crushing Japan, down to the present moment when Japan again stands exposed to a Russian come back as the result of our interference in Manchuria, American diplomacy has unwittingly played into the hands of Russia at the expense of Japan.

The evidence keeps piling up that American books on the Far East need revising. In order to cater to public opinion, anti-Japanese sentiment has been appealed to by twisting facts to make them appear as though Japan was solely to blame for our defeat. A new race of American historians is growing up who will have the advantage of more accurate evidence in regard to Far Eastern Affairs on which to base their conclusions. Isvolsky's testimony will dispel one myth at least.

The following quotations are taken from the book, "Isvolsky and the World War" by Dr. Fredrich Stieve, translated from the German by E. W. Dicheś and published by George Allen & Unwin Ltd.

G. B. R.

* * *

"There was also difficulties with France in China. Leading French banks were associated with British, German and American banks in the so-called Four-Power Consortium, which proposed to grant the Chinese Government a loan of 250,000 francs. On March 15 (1911) Isvolsky asked for information as to the attitude of the Monis cabinet on this question, pointing out that part of the loan was to be expended in Manchuria, where Russia had special interests, and recalling M. Pichon's assurance that the French Government would not allow quotations on the Paris Bourse for Chinese loans of a political aim directed against Russia and Japan. A letter had already been sent on this subject by Sazanov, and Isvolsky had made inquiries of the French Foreign Minister concerning it. Cruppi's (the French Foreign Minister) written answer declares that special attention is being paid in France to ensuring "that the capital investments in Manchuria are not applied under conditions which would give rise to objections on the part of Russia and Japan." On April 25, Isvolsky transmits a Memorandum from the French

Government communicating the terms of the loan, which had in the interim been arranged. Its purposes were, first, the reform of the currency of the Chinese Empire, and, secondly, industrial development in Manchuria. The memorandum states that it is unlikely that plans obnoxious to Russia will be put forward, and in any case there will be a period of six months during which any objections can be represented. On May 11, Sazanov telegraphs that the French charge d'affaires has informed him that the Chinese Government has asked the Four Power Consortium for an advance of £400,000 on account of the loan, and that he has replied :

" Russia is interested in an equal degree both in the definition of the purpose and in the guarantees of the loan in question, since part of it is to be expended on requirements in Manchuria where Russia has important special interests, and since, according to the information available, certain Manchurian revenues are to serve as guarantees. This opens the possibility of foreign intervention in the internal affairs of this territory, and perhaps also of foreign control of them."

This time Cruppi replies, as Isvolsky telegraphs on May 20, that the British-German-American Group had already approved the advance in question, and that it is therefore advisable that Russia take energetic steps in Peking and London. On July 20, Isvolsky reports that negotiations on the whole matter are being begun over again with Cruppi's successor in the Foreign Ministry, De Selves, who is trying to leave open until later the question of the financing of Chinese undertakings in Manchuria. On this Russia demands in a Memorandum that a special syndicate be formed with Russian, French and Japanese participation, or financial operations in those Chinese territories in which Russian and Japanese rights predominate. Isvolsky regards this plan as hardly practicable, and recommends " energetic diplomatic pressure " on France. Towards the end of the year M. Verstraete, the Chairman of Directors of the Russo-Asiatic Bank, came to Paris to negotiate with the French banks. Russia refused their proposal that Japan and Russia should participate each to the extent of one-sixth in the Syndicate, and made a counter demand that the French group should retire from the Syndicate. This the French Government declared to be impossible, reaffirming at the same time that France would take care that the activities of the Four-Power Consortium should not do injury to Russian interests. Isvolsky now describes this as " wholly inadequate," as Russia is determined to participate in the financing of China. In a letter of December 27. Sazonov sums up Russia's position as follows :

" We are working for the destruction of the Syndicate by inducing France to retire from it and we regard our participation as only possible if it is so reconstructed that we have predominant influence north of the Great Wall."

The whole course of the negotiations briefly summarized above reveals a concealed and ultimately open rivalry between the two allies, France and Russia, though it is not allowed to disturb their mutual friendship, since St. Petersburg stands in need of Paris as the main avenue for her ambitions. The events sketched are also a reminder that we were immersed in an epoch in which the Great Powers were busily engaged in competition for the domination of distant parts of the earth. The striving after political power was the obverse of the rivalry of commercial and financial interests.

Then followed the second Moroccan crises and in open breach of the Algeciras Act of 1905, France declared a protectorate over the greater part of Morocco. This was colonial conquest on a large scale in close proximity to Europe and set in motion the whole perilous system of the secret expansionist ambitions of the Powers. Russia took advantage of this opportunity to extract from her Ally in exchange for her support in Morocco, a recognition in regard to the opening of the Straits for her Black Sea fleet. Isvolsky also went with equal thoroughness into Russia's desires " in regard to railways in Asiatic Turkey, her rights in the Chinese Eastern Railway question, the capitulations in Manchuria, the question of Mongolia and Chinese Turkestan, and, finally, the Chinese loan. This was a respectable bundle of claims that he opened before Russia's ally as her price for support in Morocco. De Selves expressed his readiness to enter into the frankest discussion of these questions.

The attitude of Great Britain however, retarded the answer of the French Foreign Minister, so taking advantage of the day on which the Franco-German agreement concerning Morocco and the Congo was signed (November 4, 1911) Isvolsky sends a letter to De Selves repeating the various requests of his government and concluding as follows :

" Summing up what I have written above, I venture once more to express the conviction that at the moment when France, Russia's friend and ally, is proceeding to establish her position in North Africa on a new and firm basis, the French Government, which has at all times accorded to the Tsar's Cabinet its sincerest diplomatic support, is prepared on its part to assure of its recognition of our freedom of action in the sphere of the Straits and in North China, and will not deny us its assent to the measures which we may find ourselves in a position to adopt to safeguard our interests and establish our position in those territories."

The French reply was sometime in coming. In a letter dated November 23, Isvolsky writes concerning the possibility of France fighting shy of committing herself on the question of the Straits and of the importance to Russia to have a definite confirmation of the French attitude on this question.

" So also with the questions connected with North China," he continues. " My letters give details of some of the measures which we shall in all probability have to adopt sooner or later to consolidate our position in these countries. But it is clear that this does not exhaust all the combinations and eventualities that may arise in the course of time. At the moment it is impossible to foresee how present events in China will develop. If the period of the final dissolution of the Chinese Empire is beginning, we may find ourselves compelled to extend our program. The same result might follow from active intervention by Japan, with whom we have concluded a treaty defining our respective spheres of influence in Manchuria. In all these cases we are similarly entitled to expect sympathy and diplomatic support from our Ally."

It was not until January 4, 1912, that De Selves, sent a note to Isvolsky declaring the readiness of the French Government to exchange views with the Russian Government over the question of the Straits, should fresh circumstances make an examination necessary. Continuing he says :

" As regards Russia's interests in North China. Your Excellency has been pleased to recall that the French Government has constantly declared its intention to support Russia in the defence of her interests in Manchuria, and has given concrete evidence of its goodwill in this regard in its recent prohibition of the quotation of the Chinese 250 million loan, so long as Article 16 of the Treaty, which concerns Manchuria, is not deleted and revised in the sense of the Russian demands."

" The French Government's support, this confirmed, of all Russia's rights and legitimate interests in North China, extends not only to Northern Manchuria, but also to Mongolia and Chinese Turkestan ; the policy which we have consistently followed in this region is a sure guarantee that we shall also continue it in future in these regions of special importance to our Ally."

Isvolsky's policy on its negative side aimed at the disastrous segregation in Europe of the two main groups, the Triple Entente and the Alliance. Anything which seemed to menace this perilous division drove him into extreme agitation, especially any French loan for Austria. The issuance of a French loan for the city of Budapest called forth a letter to his government (April 25, 1911) in which he again touches on Chinese affairs :

" To make due impression on M. Cruppi I made certain general observations arising out of this special case ; " Latterly, I said, " I have more than once had occasion to draw the attention of the French Government to the severe injury which might result to Russia's most vital interests from certain financial enterprises planned by French banks. Owing to her enormous extent and the peculiarities of her georgraphical situation, Rusia is vulnerable at many points in her periphery, and cannot be equally strong at all fronts. Such enterprises as the Chinchow-Aigun Railway or the network of railways in Asia Minor would burden us with immense expenditure on the strengthening of our Asiatic frontiers in those regions, and this would weaken our military position on our western frontier, to the detriment of the common interests of France and Russia. . . . . it would be exceedingly regrettable if the concern of French financiers for their personal profit were to gain the upper hand over the general aims of the two allied powers."

Further light is thrown on French and Russian policy in regard to the original consortium in Isvolsky's letters of the following year. Reverting to this subject, Mr. Stieve says ;

" It will be remembered that in 1911 there had been some disagreement between the two Governments in regard to the loan

to China from the Four-Power Consortium. It ended in a Russian attempt to upset the Consortium. The attempt failed, however. Instead, as we learn from a letter from Poincare on March 8, 1912, to the French charge d'affaires in St. Petersburg, Russia and Japan were invited at the beginning of 1912 to take part in the Chinese loan, in other words to join the Consortium. The grounds which M. Poincare advances for accepting the invitation are very significant ; to quote his own words ;

" Admittance to the Consortium would not only not weaken the position of Russia and Japan, but, subject to complete equality of rights, would enable them to participate in every advantage won. The alliance of Russia and France on the one part and of Japan and Great Britain on the other, as well as the friendship uniting the four powers, would ensure them a majority which will enable them to make themselves heard for or against the operations planned."

Needless to say, this line of thought corresponded entirely with Isvolsky's, and we find him soon occupied in urging Sazanov's agreement. The latter first put forward certain conditions for Russian participation. But on the same day Isvolsky writes that Poincare has assured him that Russia " might count absolutely on France's vate, and on help from Great Britain and Japan—that is, on a majority." This brings no result, and on March 28, 1912 the advocacy grows more urgent. Isvolsky " ventures " to express the view that under existing circumstances it is better for us to enter the Consortium than to sulk." At the beginning of April, St. Petersburg notifies the Russian Government's agreement, accompanying the notification with an express reminder of the assurances given by France to Russia on January 4 of support of her interests in northern Manchuria, Mongolia and Chinese Turkestan. Isvolsky, is, of course, gratified by this step, and reports on April 25 that it has been very sympathetically received in Paris. In this connection, he continues, I think it is my duty to draw your attention to an article of April 2/15 in the *Temps*. Even if the article is not directly inspired by the Ministry of Foreign Affairs, it undoubtedly reflects the views of the Government circles here, and brings forward the same arguments and consideration which have been put to me in the course of my conversations with the Prime Minister and other Ministers.

" The writer of the article examines the matter of the Chinese loan, not from the financial but from the purely political standpoint, and welcomes Russia's entrance into the Consortium ; in this decision of ours he sees an intention of extensive application of the Alliance in future.

The necessity of bringing the operations of the Allies into complete harmony is, in view of the writer, the indispensable first condition of success. Russia might, he says, have had a perfectly legal justification for dissatisfaction with the formation of the foreign Four-Power Consortium, whose influence threatened to extend to territories in which Russian special interests were bound to predominate. The same dissatisfaction would certainly have been felt in France, and with reason, if a consortium had been formed with the support of Russian banks, and without French participation, to finance Morocco. . . .

Here, then, we have a fresh and almost literal repetition of the familiar theme of the need for making effective use of the Entente. The semi-official article of the *Temps*, written at the instance of M. Poincare as Foreign Minister of France, might equally have come from Isvolsky's pen. Thus, the joint programme has been carried through in regard to the Chinese loan, and it was quickly acted on. On May 9 the Russian Foreign Ministry announced that an Austro-Hungarian capitalist group was seeking admission to the Consortium. The French Government set to work at once to defeat this Viennese " intrigue." According to Isvolsky's telegram of May 11, Poincare told the Austrian ambassador, when the latter communicated his Government's proposal, " that in this case there would be an obligation also to admit Italy and Belgium, which might arouse opposition both of a financial and political nature, and that in any case France could only act in this matter in full agreement with Russia." He also, true to his methods, proposes that Russia, France, Great Britain and Japan should give Austria a joint reply, refusing in terms to be agreed upon between them. This is accordingly done, although the Consortium itself had decided against Austria. In regard to Russia's concern for consideration of her special interests in China in the application of the moneys lent to the Chinese Government, Sazanov received a further special memorandum from Poincare holding out the prospect of every assistance from France. Its terms, according to a telegram of July 8, 1912 are as follows ;

" The Prime Minister has noted with interest the views of the Russian Government. With reference to M. de Selves' letter of January 4 and that of M. Georges Louis of March 31, he gladly gives the assurance that the French Government will continue to give its support to the Russian Government in the Chinese Consortium. It will use its influence both with French bankers and with foreign Cabinets, and will make special efforts to secure the effective operation of the fundamental agreement existing between the four governments, in the matter of the application of the moneys advanced and of the questions connected therewith, such as those of guarantees and of the reliable control of the stocks, questions to which in its view every loan must be subordinated."

Thus in this affair a solution entirely agreeable to Isvolsky was secured. The group of four Powers, France, Russia, Great Britain and Japan, was opposed, apart from America, only by Germany, who had been placed definitely in a minority by the exclusion of Austria. France had done everything to bind her Slav ally to her by her ready assistance. Another step has been gained towards the ideal of a political regrouping.

The British Strike

By George Bronson Rea

Mr. George Bronson Rea was in London during the Strike. This article contains his impressions at the time.

Written during the Strike.

THE British nation is committing harakiri. Disguised as a General Strike, the short dagger-like sword has been plunged into the bowels of the nation with the utmot equanimity and calmness by the Executives of the Trades Union Congress, the answer of the Working Man to the imaginary tryanny of a Tory Government and Plutocrat Employers. The death slit may be stanched and sewed up ; Britain will survive the attempted suicide, but she will emerge from the blood-letting emaciated and enfeebled, facing a long period of convalescence under skilled nursing before recovering anything like her former vitality.

The outcome of the present General Strike, Revolution, Civil War (call it what you will) whatever it may be politically, however it may affect the demands of the coal miners, will have far reaching

economic effects. The ability of the British manufacturer to compete successfully in world markets will be still further weakened, hastening the day when he must surrender his proud international trade position to others and be content to exist under the protection of reciprocal tariffs that assure to his products preferred markets within the Empire.

The British are in a most vulnerable position. To eat they must work. They must sell the products of their toil in order to purchase their food supplies. Food there is in plenty throughout the world, but it can be had only at a price. The most powerful navy may guarantee that the sea-lanes are maintained always open for this food to reach the mouths at the consuming end, but the combined sea and, air forces of the world cannot force that food to leave the hands of foreign producers until it is paid for. Britain produces about twenty per cent. of her food. If for any reason she fails to receive the remaining eighty per cent. from abroad her people starves.

A nation that cannot feed itself and deliberately impairs its power to purchase food from other countries is committing suicide. Let the exports of manufactured products fail in quality or price, let their price become so high that foreigners purchase their requirements from competitors, and Great Britain's ability fo feed itself will cease. Its industries will become paralyzed, the people will be thrown out of employment and unless preferential tariffs with the Dominions are negotiated to assure a cheap and steady supply of food from these sources in exchange for manufactured products, the days of England as a great nation are numbered.

Whatever the merits of the coal controversy between the Government, the Mine Owners and the Miners, the facts connected with the industry as disclosed in the Coal Report indicate clearly that its former key position to British industry and trade is lost. It may be recovered to some extent by adopting the remedial measures recommended by the Government Coal Commission, but the day of cheap coal which gave to Great Britian her supremacy in world commerce, is lost, never to return.

Coal the Foundation

Great Britain's ability to pay for her imported food has for many years depended largely on her huge exports of coal. The possession of cheap coal has developed her magnificent mercantile marine and shipbuilding industry. In the last fifty years Great Britain has only doubled her coal output while world production has gone up in the same period ten-fold, in which the British share fell from two-thirds to one-fifth.

Any further dimunition of coal exports must be met by an increase in manufactured products to make good the loss of the nation's purchasing power. Some practicable plan may be devised that will permit the industry to survive, but whatever is done at this time will entail endless controversy and a long period of reconstruction and readjustment. In the meantime, Britain's competitors will establish themselves firmly in her favored foreign markets.

Seven years after the armistice when every other industrial country in the world has readjusted itself to changed conditions, finds England with over a million unemployed supported by the state, seething with discontent and plunged into a General Strike aimed at the foundations of its government and institutions. The nation is carrying a burden of unheard of taxation, "stabilized" by the Chancillor of the Exchequer at £800,000,000, of which some £40,000,000 a year goes to keep the idle fed and the discontented from mutiny. At any time this sum is liable to be increased with additional subsidies and doles. Britain is taxing the rich, laying a load on industry in order to bribe the poor from rising; Socialism disguised as Parliamentary Government. It is certainly Popular Government with a vengeance.

Balance of Trade

The balance of trade is going steadily against Great Britain. She is living on her accumulated hoard of wealth, rapidly eating up her reserves. If her foreign rivals make further inroads into her overseas trade and the Labor Leaders adhere to a program which still further increases the price of her manufactured articles, the hungry millions of Britain will rise in their might and repeat the crime of Russia. With her vast extent of rich, agricultural territory, Russia can raise her own food, sustain life and survive the experiment in Sovietism. Britain cannot. A Labor revolution in England wiping out the capitalist system which preserves its trade position and assures its food supply, means slow death by starvation to the millions unable to escape from the country.

The Labor Leaders may look upon the General Strike as a perfectly legitimate weapon to redress their grievances; the Government may denounce it as illegal and call it Civil War, Revolution, an unconstitutional assumption of authority by a minority, but a cold-blooded analysis of the situation revels that its true legal definition is Murder, the calm, deliberate plunging of a knife into the vitals of a great nation by those who know exactly what they are doing.

The most famous lawyer in England declares the strike to be totally illegal, that the Trade Union Executives and every workmen who obeyed their orders has broken the law of contract and is personally liable to be sued for damages. That is one interpretation of the written law, but there is a higher law that is not yet been written into the statute books of England. Other countries can afford the luxury of settling their labor controversies by prolonged strikes, even to a general strike. A general strike in England under her present perilous economic condition is as much treason to the nation as though the Labor Leaders sold out to the enemy in wartime. A general strike in England that permanently cripples its industries and destroys the purchasing power of the people, condemning them to starvation and death, *is Murder in the First Degree.*

The day is coming when the people of Britain, Capitalists and Workers alike, will demand that a new law based on this conception of crime will be added to their legal code. The Liberty of a people is one thing; the Right to Exist is another. When the exercise of constitutional liberty by a small minority deprives the majority of the Right to Exist, it is time these liberties were curtailed.

And the Sequel

Written after the Strike.

P.S.—London, May 14, 1926; I'm wrong. Great Britain don't need any special legislation to save the country from the consequences of a general strike. The British people are quite able to look out for themselves without it. Never in history have a people exhibited such calmness and determination to preserve their national life and institutions as have the British in the attempt to deprive them of their liberties and right to exist. The sturdy manhood and common-sense of the Anglo-Saxon once more causes us to be proud of the breed. The Soviet leaders have learned a lesson they will not soon forget. In the future they will give England a wide berth.

The Prime Minister and Cabinet are to be congratulated for the firm manner in which they met the crisis but the real victory belongs to the people, who sprang into action to meet the peril from within in the same unconquerable bull-dog spirit that brought them together twelve years ago to face the enemy from without.

Just one word about the press. The strike tied up all the newspapers with a bang. The government immediately commandeered the plant of *The Morning Post* and issued an official gazette of four pages. The larger newspapers circulated mimeographed sheets, hand-bills and pages of all sizes and descriptions and after a week a few were able to bring out four page editions. Now that it is all over they are very busy throwing bouquets at themselves and telling the world just how they did it. It may have been a wonderful exhibition of enterprise, but somehow I am not convinced. I have seen the trick done much better. When the Chinese went on a general strike in Shanghai last June and the printers and compositors walked out of all the newspaper offices, *The North China Daily News* did a much better job in overcoming the situation than any of the London dailies. The number of copies may have been less, but in the general editorial work, make up, composition and every other feature, the Shanghai daily with its limited resources got out a better publication under far greater handicaps than its big British contemporaries. This little criticism don't mean anything, as after all, the "*North China*" staff comes from the same litter of cubs. Still, it is just as well that people in China should know the truth.

The Pendulum Swings

Anti-American Movement Follows the Wake of Anti-Japanese and Anti-British Movement Attacking America's Principal Interest in China, the Missions

IN South China, where popular movements have risen since the Taiping Rebellion, anti-Americanism is displacing the attacks on Japan and Great Britain. The Chinese opposed Japan because of the Twenty-One Demands and the Shantung Settlement in the Versailles Treaty; they opposed Great Britain because of the May 30 shooting; they are hitting now at Christianity as the special sphere of American activities. But in reality, it was not the Twenty-One Demands or Shantung or May 30 which aroused the Chinese; it is not Christianity which annoys them now. At every time, since the impact of Chinese and the foreigners from over the seas, whenever the Chinese found themselves in an unfortunate situation, whenever the officials were oppressing the people unmercifully, whenever, the prospects of the country seemed hopless, the people attacked the foreigners. This historical fact is evident in the long list of anti-foreign movements and agitations which ended in the Boxer Rebellion; and in the boycotts and strikes which culminated in the anti-British boycott of last year.

The United States regarded itself as impervious to this boycott movement. For the American people were the favorite of the Chinese. They had returned the Boxer Indemnity; they had never taken an inch of Chinese territory; they have actually spent more money in China for health and education than they had taken out of the country. The characteristic representative of the American people in China, is not the official or the merchant, but the teacher and preacher, the doctor and scientist. Wherever, one went, one heard the suculent phrase: "America is our only friend." This was particularly true during 1919-1921 when the Chinese were waging an economic war on Japan, and when they expected that the United States would go to war with Japan for the sake of China. If was a sad disappointment to many Chinese and to some Americans in China, that the United States did not fight Japan—did not destroy itself to pull China's chestnuts out of the fire.

Dr. Sun Yat-sen placed his hopes for many years in the United States, because he reasoned that it was to America's interests to fight China's battles. He formed friendships with Americans and maintained a propaganda bureau in the United States to agitate for his purposes. He actually sent a man to the United States to recruit instructors for his army. Dr. Sun's adherents now contend that the United States failed them, that whenever it came to a real issue, the American Government supported their enemies, the Peking Government. Coming under the Russian influence, they tended to divide imperialism into three phases: 1. Territorial imperialism, Japan; Commercial imperialism, Great Britain; Religious imperialism, the United States. General Chiang Kai-shek says that he prefers Japan and Great Britain to the United States because the former countries are more sincere in their imperialism.

The Cantonese say that the United States claims not to have an inch of territory in China but Americans live in concessions for which other nations are responsible and that in those concessions, the Americans participate in all imperialistic enterprises, while allowing the British, French and Japanese to take the blame and assume the responsibility for such enterprises. They say that when gunboats come up the Pearl River, the American gunboats are with the others, although the Americans say that they have no predatory intentions in China. They demand that the United States assert a policy of sincerity that the United States either admit its imperialism or renounce the "unequal" treaties.

In pursuance of this demand, Canton and other groups in China are attacking the missionaries, as the leading American enterprise in China. They hit oil and tobacco, but they are small compared with the missionaries. Any large American Christian institution has a larger plant that any one of the oil installations or tobacco factories. The anti-Christians are fighting these institutions not because they are Christian but because they are American.

In this movement, one sees the forerunner of the collapse of American policy in China—the policy evolved by the late Dr. Reinsch; of giving the appearance of the utmost friendship to the Chinese, while at the same time, supporting to the limit the Peking Government and at the same time walloping Japan and Great Britain on the side. It is an iniquitous policy which is bound to fail because it is dishonest and insincere. Japan and Geat Britain have patiently suffered by it for years, but the Chinese are the first to challenge its sincerity and to call for a show-down. The American people do not understand the unmoral character of this policy because they take only a casual and sentimental interest in China. But as American commercial interests become more important, this attitude is bound to change.

Mr. Strawn Comes to China

WHEN Mr. Silas Strawn came to China to represent the American Government on the Tariff Conference and Exterritoriality Commissions, he was heralded as a very great man, who would turn out to be a second Dawes. In China, it was reported that he was a very great lawyer in Chicago and that he might even become Secretary of State after the tremendous work he would do to straighten out China's finances. Mr. Strawn, it was expected, would assume leadership in the Tariff Conference, he was elected Chairman of the Extraterritoriality Commission. As those things go, Mr. Strawn started with his right foot forward. But it was a "one step" affair. For Mr. Strawn could not forget Chicago, Chicago politics and Chicago methods. He tried them in Peking and had knots tied all about him by the more competent and experienced diplomats whom China had selected to represent her.

Mr. Strawn's major difficulty at the Tariff Conference was his inability to realize that he had been sent to China not to make a reputation for himself but to represent American interests. Mr. Strawn seems not to have realized that the Tariff Conference was called to revise various commercial treaties and that his major job was to prevent his nationals from being loaded down with the increased revenue. As a Chinese statesman said: "It was not our business to protect American interests. We were there to protect China. Mr. Strawn should have looked after the United States."

Mr. Strawn was apparently not interested in American trade in China, for the schedule of luxuries clearly was juggled under his very eyes to fix the major portion of the increased revenue on goods originating in the United States. Perhaps Mr. Strawn did not know what goods originated in the United States. Perhaps his great experts had no notion of the origin of the goods labelled luxuries. Or perhaps in the middle-western mind of Mr. Strawn there was a concept that a few dollars more on a case of American goods did not matter, as Americans could stand increased prices; he did not examine the relationship between the standard of living and the retail price of commodities. He seems to have wanted to be known in Peking as a good fellow—as the man who would help China get $90,000,000 even at the expense of American commerce in China.

Now, no one can object to China's obtaining increased revenues from the Customs or other sources. But China presents a unique problem to the world in that there is no central government

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The Chinese Eastern Railway

By Dr. C. C. Wang

THE Chinese Eastern Railway was primarily the cause of the Russo-Japanese War, and was instrumental in bringing about the Russian Revolution. Ever since its conception in 1896, it has been constantly creating suspicion among the Great Powers and keeping all concerned in a state of anxiety. With a length of only 1067 miles and an average gross earning of about 30 million dollars per annum, the Chinese Eastern Railway has certainly acquired more notoriety than any other railway of its length.

First of all, it may be asked, why such a small railroad as the Chinese Eastern should have created so much mischief and attracted so much attention. The foremost reason seems to be the existence of extraterritoriality in China. On account of extraterritorial privileges, China could not exercise any jurisdiction over foreign citizens or foreign firms in China. Consequently, the Chinese Eastern Railway Company—a stock company originally registered under Russian law—and its Russian employes, together with the large number of other Russians who came with the railway, carried with them Russian jurisdiction and Russian police everywhere they went. Thus the whole zone traversed by this system, including the South Manchuria Railway, was alienated and virtually transformed into Russian territory. Not only all foreigners, including all sorts of adventurers, opium-smugglers, and other bad characters within this long zone were free from Chinese law and Chinese jurisdiction, but even Chinese bandits, anarchists, criminals, etc., were at once beyond the reach of Chinese law the moment they managed to escape into this long zone or into any of the numerous towns within this zone. This fact, together with the abusive use made of the Chinese Eastern Railway for colonization and exploitation purposes, which we shall examine further, seriously jeopardized China's integrity.

Dr. Chin Chun Wang, C.E., Ph. D., LLD.
President and Director General of the Chinese Eastern Railway.

A comparison may help to make this situation clear. If we imagine that the Boston and Maine and the New York, New Haven, and Hartford railroads were a Russian corporation and that these railroads and all their employes, together with all other foreigners along the railroad, etc., were under Russian law with Russian courts and police (the number of such police being increased as Russia saw fit) and that all sorts of bandits, bootleggers, etc., within the railroad zone would be free from American jurisdiction, we could see what would be the effect upon the states traversed by these railroads and what would be the repercussion of such a state of affairs upon Washington. And this was exactly the state of affairs in the Three Eastern Provinces (Manchuria) until 1924, when Russia's extraterritorial rights were cancelled.

The second reason seems to be geographical. A glance at any map will show that China, like her homes and her cities, is "walled in" on all sides by immense barriers. On the east and south is the China Sea; on the west and southwest we have the Yunnan and Tibet mountains; on the north we have the Mongolia deserts; while the Three Eastern Provinces with their deserts and mountain ranges serve as a "helmet" to China's capital. Thus "walled in" and protected from her neighbors, China's political and economic systems have been accordingly developed through the past centuries. Once the Chinese Eastern Railway was built, it immediately broke the barrier between China and the West. Her "helmet" was pierced. Europe was brought to Peking within seven days. Such a penetration as that made by the Chinese Eastern must have had an effect upon China no less immediate and far-reaching than the penetration made by the steamship through the seas, as shown by the fact that, following the construction of the Chinese Eastern, China's foreign relations became far more important and complicated in the northeast, where there had never been much difficulty, than in other directions. A cursory review of China's foreign relations since 1896 will at once bear this out.

The Three Eastern Provinces, through which the Chinese Eastern runs, have an area equal to that of Germany and France combined, rich in forests, mines and fertile land, with a poopulation of over fifteen millions. So long as they were left alone, Peking felt safe. Potentially and strategically, the Three Eastern Provinces are so situated that any predominating foreign influence there would have an immediate repercussion upon Peking, because they are so vast, so rich, and so near. The seizure by a foreign power of such an important province as Canton or Fukien would perhaps have less effect upon Peking than a similar catastrophe in the Three Eastern Provinces. Therefore, what happens there not only constantly causes alarm in all China, but also creates uneasiness among those powers whose belief and interest it is to preserve China's integrity.

But a railroad itself, as understood here in America, could never have done so much mischief and caused so much concern as the Chinese Eastern. Besides the two former reasons, it is largely the abusive use of the railroad as a means of exploitation and conquest that has made the Chinese Eastern notorious. As in the past, when disasters associated with the railway were either due to the defects of the agreements concerning the railway, or were the result of improper interpretation or abuse of these agreements, so in the future either the phraseology of the railway's existing agreements or any improper execution or abuse of them may yet lead to further difficulties. We shall, therefore, endeavor to examine, briefly, the origin and the principal vicissitudes of this railroad, as well as its agreements in so far as they have had any immediate bearings upon international relations.

Russian Activities in the Far East

The late Tzar Nicholas, upon his ascension to the throne, was anxious to spread Russia's influence in the Far East. With this in view, the gigantic scheme of the Trans-Siberia Railway was carried out with amazing vigor and speed. A few years from its conception, the whole railway, with a total length of more than 5000 miles over the vast territory of unknown Siberia, was pushed through to Vladivostok. As the left bank of the Amur River is Chinese territory, the railroad had to be built along the right bank of the river, thus describing a big semi-circle from Chita to its eastern terminus. The idea soon came to the mind of the Tzar and his ministers that if the road could be carried from Chita directly southeast to the sea through Chinese territory, the distance between Vladivostok and St. Petersburg could be reduced by about 500 miles. Moreover, the operating and maintenance difficulties due to climatic and other conditions of the country would be greatly reduced. No time was lost in carrying out this idea.

In 1896 Li-Hung-Chang was sent by China as Special Envoy to St. Petersburg in connection with the Tzar's coronation. Soon after his arrival in Russia, he was approached on the subject of the proposed short cut. Naturally Li hesitated to agree. The Russian authorities emphatically emphasized that the scheme was only for reducing the distance and the operating difficulties of the Trans-

Siberia Railway and that the line should be exclusively devoted to commercial and cultural purposes. It was not until much pressure was brought to bear upon him, even to the extent of making him understand that it was the Tzar's own wish, that Li agreed to grant the concession. At first Russia wanted the railorad to be constructed and owned by the government, and it was due to Li's determined objection that a private corporation, called the Chinese Eastern Railway Company, was organized specially for the purpose.

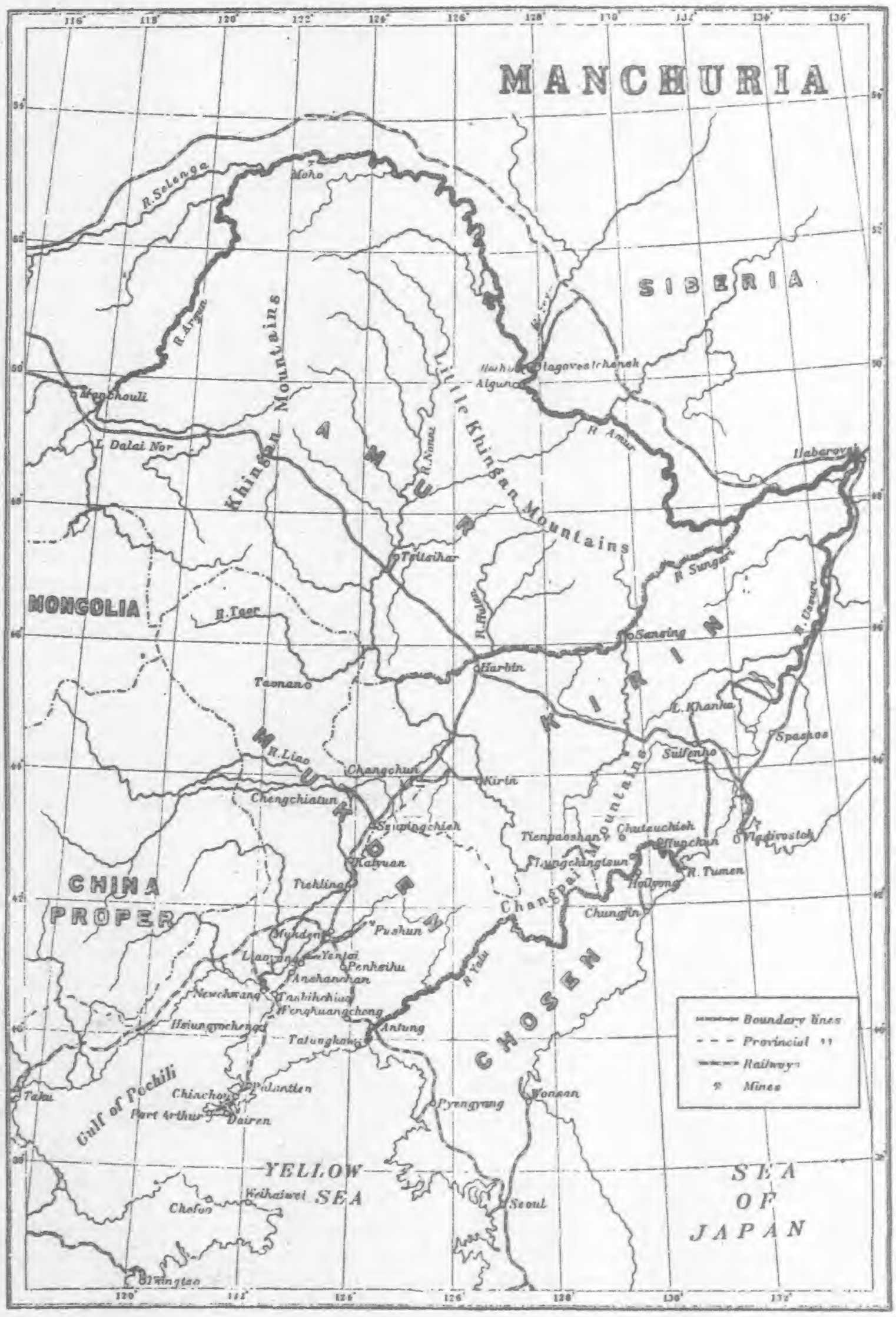
As a preliminary step, the Russo-Chinese Bank was organized, in which China invested five million taels, or about $4,000,000 gold at that time, as her share of capital. An agreement consisting of five articles along general commercial lines was adopted, specifying that China should share in the management, as well as the profit and loss, of the bank's business in proportion to her share of capital.

The Fateful Concessions

In turn, another agreement was signed between China and the Russo-Chinese Bank, by which China granted to the bank the concession for the construction and operation of the Chinese Eastern Railway, which connects the Trans-Siberia Railway at Manchuli on the west and links up with the Oussuri Railway on the east. The bank was made the *entrepreneur*, or undertaking company, which was sometimes found in early English practice.

Again, in this agreement with the bank, it was provided that a separate stock company should be organized for the construction and operation of the railway, which should be called the Chinese Eastern Railway Company. This stock company should

(1) issue its own shares to the extent of five million roubles ;
(2) the president of the Company should be Chinese ;
(3) the seal of the company, which is the sign of authority, should be issued by the Chinese Government ;
(4) China should be responsible for the protection of the employes of the railway ;
(5) all government land required by the railway should be granted free to the company ;
(6) all materials for construction should be free from duty and all railway land should be free of tax ;
(7) Russian troops might be transported through Chinese territory by the railway, but such troops should not stop over en route.



The agreement further provided

(1) that the shareholders of the company should be Chinese and Russians only ;
(2) that on the expiration of eighty years from the commencement of traffic the whole railway should revert, without payment, to the Chinese Government ;
(3) that China should have the right, at the expiration of thirty-six years from the date of operation, to redeem the railway on the payment of the actual cost of the railway, together with all the debts incurred therefrom ;
(4) that all surplus of the railway, minus the percentage paid to shareholders, should be deducted from the cost of the line, to be ultimately paid by China for redemption ;
(5) and that upon completion of the line, the company should pay the Chinese Government five million taels.*

Thus, summarizing the above, it will be seen that the following steps were taken :

(1) the organization of the Russo-Chinese Bank, of which China was a principal shareholder ;
(2) the agreement between China and the bank governing the concession of construction and operation of the railroad ; and
(3) the formation of the Chinese Eastern Railway Company, which was to take over from the bank the concession granted by China.

It would appear at once that the whole arrangement suggested a series of wheels within wheels.

The terms of the concession granted by China were considered by St. Petersburg as very favorable to Russia. China at the time only cherished the pious hope that the peaceful spirit of the agreement, as repeatedly asserted by the Russian authorities, would guide the execution of the agreement.

An analysis of the agreement will show that for an enterprise of such importance there is much lack of clearness in the text. Yet, ambiguous as it was, there was ample room for co-operation along commercial lines for the benefit of both. Unfortunately, advantage seems to have been taken from this lack of clearness in the agreement to make things even less palatable to China. While the agreement provided that the shares of the Chinese Eastern Railway Company should be bought only by Chinese and Russians, the issue of the shares was handled in such a way that no Chinese

*This amount has never been paid in spite of repeated representations made by the Chinese Government from time to time.

was permitted to enjoy this provision. As a matter of fact, it was said that the shares were opened for sale at one o'clock on a certain Saturday in St. Petersburg and closed at five minutes past one after the announcement of the sale. The agreement says that the surplus of the company, after what may be divided among shareholders as dividends, should be applied to the redemption of the road in China's behalf; but it does not say to what extent the surplus may be divided as dividends. As the total share capital is only five million roubles, and as a railway of such length and importance as the Chinese Eastern may, under proper management, earn a surplus equal to two or three times the amount of the total share capital, the question of division might develop into an important question as the surplus of the railway grew. It is understood that this point was raised in 1920, and that by an exchange of letters between the representatives of the shareholders and the Chinese Government a certain scale was agreed to, whereby certain proportions of the surplus were to be divided as dividends and certain proportions should be applied to the redemption fund in behalf of China.

Russia's Breach of Faith

Construction of the Chinese Eastern was begun in 1897 and was pushed with unusual speed. In the meantime a new phase of Russia's scheme was introduced. In March, 1898, that is about one year and a half after the signing of the original agreement, Russia secured under duress from China the lease of Liaotung Peninsula for thirty-six years, as well as the right to construct a branch line from Harbin, a central point on the Chinese Eastern, directly southward to Ta-Lien-Wan (Dairen), with the proviso that the agreement of 1896 between China and the Russo-Chinese Bank should apply with equal force to this branch line. This step, as was acknowledged by Count Witte, who originally negotiated the Chinese Eastern Agreement, was diametrically contrary to the understanding given in 1896, when Russia definitely assured Li that the Chinese Eastern would not go southward from a straight line connecting Chita and Vladivostok. It was understood that there was much opposition in Russia to this breach of good faith with China. But the jingoistic elements had their way. The Russians themselves, to use Count Witte's words, "broke the agreement and brought about the situation from which they suffered humiliation and disgrace."* The original agreement of 1896, one-sided as it was, was not bad enough to expose Russia's naked designs in the Far East, had she made any attempt to honor it. It was the scarpping of that agreement, which was dictated on her own terms, that led to her expansion southward where she, within the period of five years, met her humiliation.

Another dangerous step was the introduction of Russian civil and military administration along the railway. Large areas of land, which were obtained at numerous places under the pretext of being required by the railway, were set aside and mapped out for cities, towns and villages for the settlement of Russian immigrants. These municipalities were all governed by Russian administration, and were under Russian law and police. Thus the whole zone penetrated by the railway was made into a Russian colony, and China's integrity violated.

In 1900 the Boxer uprising gave a further excuse to Russia for extending her imperialistic designs. Taking as a pretext the suppression of the Boxers, Russia sent a large army to occupy the Three Eastern Provinces. At the outset, the whole Chinese population of Blagovieschensk, a Chinese settlement on the right bank of the Amur, of about 5000 men, women and children, were driven into the Amur at the point of the bayonet. In consequence, the Three Eastern Provinces were soon over-run by Russian troops. Proclamations were posted by Russian commanders which amounted to declarations of conquest. As a Russian engineer of the Chinese Eastern then wrote: "Punitive expeditions were made with no other end in view than to furnish an excuse for new promotion and new looting." Peking being occupied by foreign troops, the Chinese Government was helpless.

I may be permitted to digress here by remarking that these brutalities have not been forgotten by the Chinese. When the Russian Government collapsed in 1918, and the Russians along the Chinese Eastern were helpless, there was considerable talk among certain quarters of the Chinese people to retaliate the Blagovieschensk atrocity by driving an equal number of Russians into the Amur. It was forgiveness and not forgetfulness that prevented such a retaliation. As a matter of fact, the leading authorities made it a special point to protect, with equal vigor, the Russians of all parties and all "colors," believing that two big neighbors like China and Russia, with a contiguous frontier of some four thousand miles, cannot live happily by returning a tooth for a tooth and an eye for an eye. In spite of the Chinese authorities' shortcomings, which were many, in their handling of the Russians during these trying years since 1918, one thing I can vouch for, and that is that generally speaking they tried to treat the Russians fairly and with sympathy during their days of distress. Relief measures were adopted by the authorities, in spite of their own financial and other difficulties; and the absence of any serious conflicts between the Chinese and Russians during these years constitutes some of the results.

Russia occupied the Three Eastern Provinces ostensibly for the purpose of helping Peking to quell the Boxers. The Boxer disturbance soon ended, but the Russian troops continued to remain. The result was widespread distrust on the part of China, jealousy and malevolence in Europe and alarm in Japan. The Chinese Eastern and its southern branch were pushed through just in time to witness the Russo-Japanese War, which was declared in 1903.

Japanese Activities in China

What happened afterwards must be fresh in the minds of all. Russia was defeated with no small credit due the local Chinese, who helped in numerous ways. By the terms of the Portsmouth Treaty it was arranged that, subject to China's consent, Japan should take over the southern branch of the Chinese Eastern Railway up to Chang-Chun, a point approximately half way between Mukden and Harbin, together with all right connected therewith. In December of the same year, Japan secured China's consent to the Russo-Japanese arrangements, with the further right of constructing a branch line from Mukden to Antung, a point near the western border of Korea. The Mukden-Antung line was to be operated by Japan for a period of eighteen years, beginning December 22, 1905, and on the expiration of this date China had the right to redeem it at a price to be settled by arbitration. By the famous twenty-one demands, which Japan made upon China in 1915, China has up to now been prevented from exercising this option, although she reminds Japan of it repeatedly.

Construction and Management

A word about the construction and cost of the railway may be of interest. With the exception of the tunnel under the Hingan Mountains and the bridge over the Sungari at Harbin, the Chinese Eastern runs through very easy and flat country. The bridges and tunnels were well built from an engineering point of view. But the question of economy, as shown by the accounts of the railway, did not seem to have entered into the minds of the railway authorities. On the contrary, there seems to be much evidence to fortify the impression that unnecessary lavishness in the spending of money was generally encouraged. Enormous sums were spent for the erecting of magnificent residences, numerous barracks, palacial club-houses, magnificent churches and schools, etc., all with the idea of inducing Russians to settle along the Chinese Eastern. All these expenditures were charged to the accounts of the railway, thus swelling the cost of construction to something like 400,000,000 roubles, or about $200,000 gold per mile!

A comparison of this figure with the average cost of $63,000 per mile for the Chinese Government Railways may be illuminating, in view of the fact that, on the whole, the construction and engineering features of the Chinese Eastern were not more difficult than those of the Chinese Government Railways. As the latter were constructed by foreign engineers with imported materials and borrowed money, and with a consequent expenditure considerably higher than under ordinary circumstances, this high cost of the Chinese Eastern will at once appear significant. Extravagance and other irregularities were said to be responsible for this abnormally high cost of constrruction.

Space will not permit any detailed study of Russia's use of the Chinese Eastern during the years 1905-17. Suffice it to say that since the Portsmouth Treaty Russia has exerted every effort to

*Memoirs of Count Witte. 1920.

consolidate her position in north Manchuria by colonization and other methods. It was said that Russia intended to make Manchuria a second Bokhara. The Chinese Eastern Administrative departments were made the headquarters of all civil, military, political and religious activities of the whole colonization scheme. A cursory analysis of the organization of the Chinese Eastern Railway Administration and its budget of those years will show at once the unusual character of that railway in those days.

First of all there was what was called the Civil Administration Department, which took charge of the local land taxes, as well as taxes on wine, tobacco, etc. Besides other activities this Department had supervision over the police, the law courts, and the municipal councils of towns. Churches and schools of all grades were also under this Department. About one million roubles was expended annually for the churches and schools. At times it issued passports and maintained "diplomatic" agents. In short, the actual administrative work of the railway, as compared with the extra-administrative activities, were insignificant. The General Manager of the railway appeared to the people much more like a viceroy of the province than a railway executive. "The railway officials," observed an English writer after a special study of the situation during these early years of the railway, "engrossed in the political and strategic aspects of the railway, seemed to have disregarded its commercial possibilities. The result was the imposition of prohibitive tariffs. The railway has thus far done nothing to prosper trade, although the western and eastern sections pass through a country that promises at least reasonable returns on any well-managed line that serves it."*

All these administrative and extra-administrative expenses were charged to the books of the railway. This, together with the lack of the development of traffic, which meant reduced earnings, accumulated a net loss of about 450,000,000 roubles as the result of twelve years of operation from 1905 to 1917. In consequence, at the end of the Tzarist régime the books of the railway showed a total liability of about 850,000,000 roubles against that property. There was a story at the time that the Tzarist Government considered it good policy to swell the cost and debt of the railway so as to make it unattractive for China to redeem at the end of thirty-six years. If this story was true, the Tzarist authorities certainly succeeded splendidly.

Acute Situation from Rouble Depreciation

Following the fall of the Tzarist Government in 1918, the enormous annual subsidies no longer came to the railroad. In order to meet the ensuing difficulties, the General Manager therefore resorted to the issue of bank notes in the name of the railway. In the meantime, the rouble began to depreciate rapidly. It must be remarked here that ever since 1900 rouble notes had flooded the northern part of the Three Eastern Provinces. It is said that Russia really spent little gold in the Far East, and simply shipped car loads of rouble notes to carry on the business. Chinese land, Chinese labor, and Chinese materials for the construction of the railway were paid for in these notes. Chinese goods were bought and shipped to Russia with these notes. As a matter of fact, following the occupation of Manchuria by Russian troops, rouble notes became the currency in the northern part of the Three Eastern Provinces. All business was transacted with them. So a tremendous amount of these notes were absorbed in the country. As the situation in Russia became worse and worse, so the value of the rouble notes depreciated more and more towards zero as a limit.

The effect can readily be appreciated. Everyone in that part of the country suffered in proportion to the number of rouble notes which he was unable to get rid of, as well as in proportion to the loss in value of the notes resulting from his success in passing them out of his hands. There was general suffering all over. Many business houses collapsed ; many well-to do people became paupers. The savings of years from the hard labor of the multitudes of working and farming people were wiped out by this process. Judging from the amount of rouble notes held by the Chinese population alone, it almost appears reasonable for the local people to say that in reality Russia built the Chinese Eastern Railway with paper instead of real money.

As the situation in Russia and Siberia became more acute, the Chinese Eastern was affected more and more. There was general chaos and disorder. Strikes and partisan fights became frequent. Murders and assassinations were numerous. Following the fashion of the time, the General Manager of the railway, one day, rode out to a place just outside of Chinese territory and there in his private car declared independence and proclaimed himself the Supreme Ruler of the Russian Far Eastern territory. This briefly shows the general situation of the Chinese Eastern from 1917 to 1920.

Meanwhile the Allied Powers began their expedition into Siberia and eastern Russia. For the latter purpose and for the evacuation of the Czecholosvakian prisoners of war, the Inter-Allied Technical Board was organized, with its headquarters at Harbin, to supervise the technical and economic operation of the Siberia and the Chinese Eastern railways. The eminent American engineer and railroad administrator, John F. Stevens, was made the president of the Board, with a representative each from China, France, Great Britain, Italy, Japan, Russia and Czechoslovakia as members. Some two hundred American railroad men were distributed along the line from Vladivostok to the Ural Mountains, while about fifty Chinese railroad engineers and operating men were appointed by the Board to co-operate with the Americans to supervise the Chinese Eastern section. As the Board was not authorized to discipline the railway employes, and as its orders had to be executed through the old railway staff, naturally many difficulties arose. It was largely due to the ability and personality of Mr. Stevens and the co-operation of the other members of the Board that the duties of the said Board were carried out so well, as was generally recognized by the Allied Governments. About $5,000,000 in gold was spent by the Board for the benefit of the Chinese Eastern and about the same amount was charged by the Chinese Eastern against the Allied Governments for the transportation of the Allied and Czechoslovakian troops. Every now and then, some of the Allied Governments would call the attention of the Chinese Eastern to the amount which the Technical Board was spending for its benefit ; and periodically the Chinese Eastern would ask the Allied Governments, which were considered responsible for the handling of the Czechs, to settle the transportation account. And there the matter stands.

The Supplementary Agreement

As the Chinese Eastern Railway is a purely Russo-Chinese enterprise, running through Chinese territory, and as the chaotic condition of the railway was causing China much trouble, the Chinese Government could not but assume some responsibility of control over the railway. Were it in any other country, the Government would perhaps have summarily taken over the railway and run it pending final settlement. China, however, took a rather more circuitous course. As the original agreement was signed with the Russo-Chinese Bank, the Government, in October, 1920, signed a supplementary agreement with the said bank for the temporary management of the railway. This was done on the assumption that the bank was a shareholder of the Chinese Eastern Railway Company, although no one seemed to have seen any shares. It was only the Statutes of the Chinese Eastern Railway Company which made the assumption feasible ; because those Statutes provided that, on the presentation of a certificate of that bank or the Bank of Russia, any Chinese or Russian may be recognized as a shareholder at the shareholders' meetings. This is perhaps another one of those wheels within the whole system, as originally arranged in St. Petersburg.

This supplementary agreement, first of all, declared that the activities of the Chinese Eastern Railway should be limited and devoted exclusively to commercial purposes. The Civil Administration, police, etc., were abolished and the work transferred to the local Chinese authorities. Of the ten members of the Board of Directors of the railway, five, including the President of the railway, were to be Chinese and the other five, including the Vice-President, Russians. A Chinese Assistant General Manager was to be appointed and a certain number of Chinese railway men added to the different departments as assistant chiefs. Vacancies in the future were to be filled by Chinese and Russians in an *equitable* manner. All important questions were to be decided by the Board of Directors by the affirmative vote of at least seven members. The payment of five million taels, as required by the original agreement, upon the completion of the line, was to be made good in bonds.

*P.H. Kent—*Railway Enterprises in China*, p. 78, 1907.

Under this agreement, a new Board of Directors was organized. In October, 1920, for the first time in the railway's history, a regular board meeting of ten members was held at the headquarters of the railway at Harbin. To save the railway from further degeneration and to face the complicated situation of 1920 was a job hard enough for any ten men, especially when these men were mostly new to the work as well as new to each other. The first effort of the Board was to face the financial situation. The rouble notes were depreciating rapidly. Up to that time the railway receipts were still in these roubles.

Benefits from Reorganization

The first and perhaps the most effective and beneficial act of the Board was to officially replace the rouble with the Chinese silver dollar which had a steady face value. This step at once put the revenue of the railway on a more stable basis, and gradually reduced the sufferings of the employes from the depreciation of the rouble. Up to that time, as the railway receipts were in roubles, the employes were also paid in roubles, the value of which often diminished by some fifty per cent. from the time an employe received his pay until the time he succeeded in spending it. The accounts of the railway were also changed into the Chinese dollar or the gold rouble as the unit. As about seventy-five per cent. of the shippers and passengers are Chinese and an equally large proportion of the expenses of the railway are local, there is no question that the unit of the railway should be the Chinese dollar, which is the currency of the place.

Gradually other administrative problems were taken up, chief among them the question of tariff and fares. In order to stimulate trade and encourage travel, a considerable reduction was introduced, bringing the tariff and fares, which were doubled during the period from 1918 to 1920, to a general level of about ten per cent. to forty per cent. higher than the pre-war figures. The volume of business was considerably increased to the benefit of the shippers. The locomotives and rolling stock, which were in a most deplorable condition, were gradually repaired, and the train service gradually improved. The current debts of the railway were regularized a little each year. In spite of numerous shortcomings, the result of the four years' work, under the supplementary agreement, showed much improvement in the railway both financially and from an operative point of view. This general improvement was, of course, made possible by the advancement made in the political and military conditions in the country. Although the Chinese and Russian members of the railway sometimes had misunderstandings and differences in their point of veiw, on the whole most of them worked for the good of the railway.

My five years' experience with the Chinese Eastern leads me to believe that among the Russians, with whom I had the opportunity to associate, there were a large number of level-headed and well-meaning men, who showed a high degree of tenacity for what they believed to be their principles. So far as my Russian colleagues and the railway staff are concerned, I found among them many able and well-informed gentlemen. There were indeed exceptions, but one finds exceptions everywhere. On the whole, I think the Russians are a great people with a large heart and a great future. If they will only devote their efforts to the development of their own immense land and to the advancement of their own enormous population, they are bound to progress in all directions.

During the Washington Conference on Disarmament, the Chinese Eastern Railway received considerable attention. Various schemes were discussed. Finally it was agreed among all the participating powers at the Conference that it was to the advantage of all interested parties to have better protection given the railway and the persons engaged in its operation, and by a more careful selection of personnel to secure a more efficient service and more economic use of funds, in order to prevent waste of property. These provisions are definite and clear, in contrast to the negative wording so frequently used in resolutions of such a nature.

Another resolution regarding the Chinese Eastern adopted by the powers, exclusive of China, states that these powers reserve the right to insist upon the responsibility of China for performance and non-performance of obligations towards the foreign shareholders, bondholders and creditors of the Chinese Eastern Railway Company, which obligations the powers deem to result from the contracts under which the railroad was built. This resolution is not so clear as the previous one. It is not definitely known by whom is meant the foreign stockholders and bondholders. As Russia was not represented in the Conference, it may be inferred that these stockholders and bondholders had reference to foreigners other than Russians. But the very contract referred to in the resolution clearly stated that only Russians and Chinese could be stockholders and bondholders of the Chinese Eastern Railway Company. So far as is known, the Chinese Eastern Railway Company never issued any stocks or bonds in its name to any parties other than Chinese and Russians. So far as the foreign creditors of the railway are concerned, there are but few and the amounts due too insignificant to deserve the attention of such an important body as the Conference on Disarmament. Therefore it may be presumed that the real motive back of the Chinese Eastern Railway question at Washington was not stated in the resolutions, but was to be found in the fact that the railway had been, and was at that time an important factor affecting the peace of the Far East.

In May, 1924, an "agreement on general principles," with English as the official text, was signed between the Chinese and the Soviet Governments. First of all this agreement provides for holding a conference, within one month after the signing of the agreement, which "shall conclude to carry out detailed arrangements relative to the Chinese Eastern Railway and other questions, and such detailed arrangements shall be completed. . .in any case not later than six months from the date of the opening of the conference." Article 9 of the "agreement on general principles" is devoted entirely to the Chinese Eastern question. As this article puts the railway on an entirely new basis and is bound to have far-reaching effects, I quote the entire text as follows:

Article IX. The two Governments of the Contracting Parties agree to settle at the aforementioned Conference the question of the Chinese Eastern Railway in conformity with the principles as hereafter provided:

(1) The Governments of the two Contracting Parties declare that the Chinese Eastern Railway is a purely commercial enterprise.

The Governments of the two Contracting Parties mutually declare that with the exception of matters pertaining to the business operations, which are under the direct control of the Chinese Eastern Railway, all other matters affecting the rights of the National and the Local Governments of the Republic of China—such as judicial matters, matters relating to civil administration, military administration, police, municipal government, taxation and land property (with the exception of lands required by the said railway)—shall be administered by the Chinese authorities.

(2) The Governments of the Union of the Soviet Socialist Republics agrees to the redemption by the Government of the Republic of China, with Chinese capital, of the Chinese Eastern Railway, as well as all appurtenant properties, and to the transfer to China of all shares and bonds of the said railway.

(3) The Governments of the two Contracting Parties shall settle at the Conference, as provided in Article 11 of the present Agreement, the amount and conditions governing the redemption as well as the procedure for the transfer of the Chinese Eastern Railway.

(4) The Government of the Union of the Soviet Socialist Republics agrees to be responsible for the entire claims of the shareholders, bondholders and creditors of the Chinese Eastern Railway incurred prior to the Revolution of March 9, 1917.

(5) The Governments of the Contracting Parties mutually agree that the future of the Chinese Eastern Railway shall be determined by the Union of the Soviet Socialist Republics and the Republic of China, to the exclusion of any third party or parties.

(6) The Governments of the two Contracting Parties agree to draw up an arrangement for the provisional management of the Chinese Eastern Railway, pending the settlement of the questions as provided under section (3) of the present Article.

(7) Until the various questions relating to the Chinese Eastern Railway are settled at the Conference, as provided in Article 11 of the present Agreement, the rights of the two Governments arising out of the Contract of August 27, 1896, for the construction and operation of the Chinese Eastern, which do not conflict with the present Agreement and the Agreement for the provincial management of the said railway and which do not prejudice China's right of sovereignty, shall be maintained.

The question of redemption will naturally form one of the most important topics in the coming conference. Russia definitely pledges that China may redeem the railway, but leaves the amount

and conditions governing the redemption to be arranged in the conference. No principle to govern the conditions and amount of redemption was laid down in this " agreement on general principles." This latter provision was altered a trifle by the agreement signed between the Soviet Government and the Three Eastern Provinces, which was later embodied in the Governmental agreements. By this, the Soviet Government " agrees.....to the redemption by China of the said railway with Chinese capital, the actual and fair cost of which to be fixed by the two contracting parties."

A careful reading of these articles will lead one to feel that it must have required much skill to frame the terms in such a pleasant way and yet make them so elastic, if not ambiguous. The circumstances which lead to the adoption of such elastic language must have been extraordinary, if not interesting. Indeed, much will depend upon what takes place in the promised conference. One thing we can prophesy: That is that whatever difficulties may lie in the agreement will be found not in what has been said, but in what has *not* been said!

The arrangement for the provisional administration of the railway, as referred to in section (6), article 9, of the " agreement on general principles," consists of eleven articles. The provisions of this arrangement, as modified by the Soviet-Mukden agreement, very much resemble those of the supplementary agreement of 1920, with the Soviet Government taking the place of the Russo-Chinese Bank. The main differences are: that the time limit for the railway's return to China, free of charge, be reduced from eighty to sixty years; that all positions of the railway should be filled by Chinese and Russians in *equal* numbers; that, pending final settlement of the railway, as provided in article 9, the net profits of the railway should be held by the Board of Directors; and that all questions of the railway, which the Board of Directors cannot decide, must be referred to the two Governments for settlement.

A careful study of this agreement will suggest at once that, unless the Chinese and Russian members of the Board of Directors are properly selected and given full power and definite instruction to manage the railway as a purely commercial business, with the sole aim of serving the public and making a fair return to the railway, much difficulty may arise. The fact that all questions will have to be decided by the affirmative vote fo six members of the Board in practice amounts to the mutual agreement of all the Chinese and Russian members. This will require that they must have a common point of view and a common interest in which both parties share equally. They must consider the railway as their own business and their own property and exert every effort to make the railway a business success. Any other motive or any effort on the part of either party to " edge out" the other will result in loggerheads.

Two other provisions of the agreement may create difficulties. First, the provision that all disagreements between the Chinese and Russian members of the Board of Directors should be referred to the two Governments for solution, will likely prove unwholesome, if not mischievous. There are numerous chances for a board so constituted to disagree; and when such disagreement will have to be settled by two governments through diplomatic channels, the railway's business is liable to degenerate into a whirlpool of diplomatic squabbles. Arbitration would certainly have been a much better method of settling such differences, if the two Governments are eager to prevent the railway from giving constant irritation.

The provision that the articles of the old agreement of 1896 and the Chinese Eastern Railway Statutes, which do not conflict with the present instruments, shall remain valid, is also misleading. These old Statutes were so long, so involved, so complicated, and so out of date, that there will be ample room for the two parties to disagree as to which article does or does not conflict with the present agreement. Fortunately, there is a clause in the new agreement calling for the revision of these Statutes within six months. This revision should have been the first duty of the new Board of Directors. The latter have taken charge of the railway since October, 1924. So far as it is known, no successful attempt has yet been made to carry out this most important provision. Therefore, they must have been working without any definite rules for guidance. Under such circumstances conflicts of opinion should be inevitable.

To have two Governments as partners in a railway business, on a half and half basis, is a new experiment. To date China has had enough trouble with the Chinese Eastern. Russia gained but little from her efforts in reading extraordinary meanings into the Chinese Eastern Railway Agreements in the past. It is to be hoped that in the future good faith on both sides will prove to the world that the experiment is a success, and that it will once for all put an end to the anxiety, suspicion and mischief which the Chinese Eastern has created in the past. If this new experiment should fail, it would seem that a totally different experiment will have to be tried, in order to prevent a repetition of what has happened in the last thirty years. At any rate and under all circumstances, all the extraordinary activities of the Chinese Eastern and other railways in the Three Eastern Provinces should be eliminated. All the railways in the Three Eastern Provinces should be managed entirely for commercial purposes and run as highways open to all foreign business on an equal basis. Otherwise China's integrity will remain violated and the open door meaningless.

Su Hwa Chalk Factory, Wuchang

The Su Hwa Chalk Factory, at Ku Tung Chieh, outside Wushengmen, Wuchang, Hupeh province, established about 20 years ago, turns out white and green coloured chalks. The factory employes about ten operatives and has a daily producing capacity of 150 boxes of 100 pieces each. The quality of the chalk is said to compare favorably with the imported kind. The factory serves an extensive market, the bulk of its product being consumed in the schools of Wuchang, Hankow, Hanyang and other big cities in Hupeh and Hunan provinces. The yearly output is estimated at 50,000 boxes, sold under the " peach " brand. The process of manufacturing chalk is rather simple. The principal raw materials are gypsum and lime. Gypsum is first burnt and pulverized and then mixed with lime. The mixture is placed in a wooden tank, into which water is added, and is thoroughly stirred with a wooden rod. If colored chalks are desired, pigment is added. The contents are then poured into a row of brass molds, in which the chalks take form as they harden. They are then dried in the sun, after which they are packed in card-board boxes for the market. Each box, containing 100 pieces, is sold wholesale at $1.07 (seven cents), but the retailers sell them for $0.12 (12 cents). The brass molds, hitherto imported from Japan, are now made by the local metal smiths. Each set or row of molds, capable of making 15 pieces at a time, costs about $20. The chalk market in Hupeh and Hunan provinces was monopolized by the Su Hwa Factory until last year, when the Chung Hwa Book Company opened a factory at Hanyang. In spite of this new rival, the business of the Su Hwa Factory is just as prosperous as before, as the demand for chalk is on the increase.

Glass Industry at Poshan, Shantung

Poshan, besides producing pane glass, is also noted for Shantung spun glass, which is much used in the manufacture of decorative screems. These are exceedingly popular among the Chinese, being sold within the limits of an ordinary purse. Travellers invariably purchase some as souvenirs. They are obtainable in Peking, Tientsin, Nanking, Shanghai, and the Manchurian provinces. They are also gradually finding their way to foreign countries as novelty goods. In Tsinan alone there are more than ten shops engaged in retailing these screens. Teh Shen Tung, Ho Hsin Hou, Chen Hsin Yu, Shieh Chen, Heng Yung Chang, and Si Ching Yu, are the leading dealers. In Poshan, six factories turn out this spun glass. They are: Chang Ching, Hua Tai, Fu Tai, Shieh Chen Hao, Jen Ho, and Chung Ho. Raw material is locally produced, at Tao Hua Chuan in the vicinity of Fu Lao Kwan, Poshan district. The exact method of manufacturing is unknown, several processes having to be gone through before that which gives it its dull crinkly appearance. The glass is in twin pieces, between which pictures are pasted. The whole makes a very attractive wall decoration. Small glass factories have existed for centuries in the neighborhood of Poshan. The surrounding hills provide abundant quartz sand, limestones, and coal. The ware produced is well-known all over China, especially in the shape of small snuff bottles, laboriously painted on the inside, lanterns and screens and thousands of other small articles such as mouthpieces for pipes, children's toys, beads, and bangles. Except for a few modern factories, it is mainly a family industry, most of the ovens not holding above 60 catties of glass.

The Philippine Islands

A Period of Recovery

MR. THOMAS HARRINGTON, British Consul-General at Manila, writes in his Report for last year that, speaking generally, the Islands during 1924 and 1925 have been making a good recovery from the slump of 1920 and 1921. While trade, however, has distinctly improved, it cannot be said that the losses of the bad years have yet been repaired. The bonded indebtedness of the Insular Government (not including provincial and municipal indebtedness) has increased from 64,000,000 pesos (say £7,200,000) at the end of 1921 to 139,000,000 pesos (say £15,640,000) at the end of 1924; most of the increase had been incurred for the protection of the Gold Standard Fund and other Government financial interests. The losses of the National Bank through advances to Sugar Centrals and other interests have also not yet been made good. The revival of trade, therefore, is accompanied by a considerable stringency. Firms are cautious in view of their recent losses and banks exceedingly conservative. The resources of the Philippines are mainly agricultural, manufactures, mining, etc., having made little progress so far, and there is consequently a limitation to the channels by which recovery may be facilitated. While, therefore, a considerable improvement has taken place in the position and an actual increase of trade, there has been hardly a return to a completely normal condition. Lack of capital and political uncertainty are also quoted as creating hesitation and hampering rapid progress. There can, however, be no doubt that with a fair development of Philippine natural resources there must be a considerable further advance in foreign trade. It will be noticed that the trade figures refer for the most part to 1924 only, but owing to the dates at which the Philippine statistics are issued, they are the latest available.

Trade

The total trade of the Islands was as follows during the years mentioned :—

Movement.	1924 £	1923 £	1913 £
Exports	30,247,726	25,730,902	9,870,984
Re-exports	204,823	306,462	81,716
Total Exports ..	30,452,549	26,037,364	9,952,700
Imports	24,302,451	18,867,133	11,106,830
Total Trade	54,755,000	44,904,497	21,059,530

The figures in currency for 1924 and 1923 do not show quite so great an advance as the sterling totals, as exchange was taken for 1924 at 2s. 3d. per peso, for 1923 at 2s. 1.7/16d., and for 1913 at 2s. 1d. Even in currency, however, 1923 shows more than 100 per cent., and 1924 more than 140 per cent. increase over 1913. The two later years recorded considerable recoveries from the slump figure of 1922, though still much below the high figures of the boom year 1920, and it may be taken that the trade of the Philippine Islands is likely to remain double that before the war with every prospect of further increases. The advance was maintained for the first half of 1925, when the overseas trade amounted to :—

Movement	Value £
Exports	16,628,725
Re-exports	130,115
Total exports	16,758,840
Imports	12,172,383
Total Trade	28,931,223

These figures are well above those for the six months to June, 1924.

British Imports

These were as follows, the percentages of the total imports being also given :—

Source	1924 £	1924 Per cent.	1923 £	1923 Per cent.
United Kingdom ..	1,256.449	5.17	886,087	4.78
Australia	548,409	2.28	508,224	2.75
British East Indies ..	358,144	1.47	385,980	2.09
Hongkong	97,215	0.40	90,467	0.48
Canada	34,560	0.14	13,996	0.08
British Arica ..	14,167	0.06	—	—
Total ..	2,308,944	9.52	1,884,754	10.18

Imports from most parts of the Empire showed a marked advance in 1924 on 1923, an improvement which was maintained in the first six months of 1925, when imports from the United Kingdom were 5.6 per cent. and from the rest of the Empire 5 per cent. of the total, of 10.6 per cent. in all. Though the actual volume of imports from the United Kingdom is back to pre-war levels, the percenage is still much below pre-war rates; but a steady recovery is being made since 1919, the lowest of many years.

Over 56 per cent. of the total value of imports came from the United States (including Hawaii). The standing of the leading countries will be gathered from the following table :—

Source	Value £	Per cent. of total
United Kingdom	1,256,449	5.17
Other British countries	1,052,495	4.33
United States	13,799,642	56.77
French East Indies	2,215,308	9.12
Japan	1,922,364	7.92
China	1,570,567	6.46
Dutch East Indies	761,513	3.14
Germany	475,338	1.95
Switzerland	367,290	1.51
France	258,659	1.07
Spain	147,203	0.61
Japanese China	114,806	0.47
Other countries	360,817	1.48

The United States leads in nearly all the items (some 450) on the import list, the main exceptions being in tropical produce, such as rice, gums and resins, quinine, coffee (raw), cocoa, etc., certain foodstuffs from nearby Far Eastern countries, hams, cattle, coal, cement, refined sugar, gunny bags, pianos, matches, olive and linseed oils, tea, jewellery, certain porcelain, earthenware, window glass, cuttlery, needles, copper sheets, enamelled ware, certain classes of silk, cotton and woollen goods, etc., in which various countries manage to compete notwithstanding the handicap of the import duties from which United State goods are free. The percentages of imports coming from the United States in recent years has been :—

Year	Per cent.	Year	Per cent.
1924	56.77	1921	63.99
1923	57.88	1920	61.76
1922	59.93	1913	50.04

Exports to British Territory

The exports to British territory and percentages of total shipments were as follows :—

Destination	1924 £	1924 Per cent.	1923 £	1923 Per cent.
United Kingdom ..	2,121,484	6.97	1,586,579	6.20
Hongkong	507,101	1.67	465,474	1.82
British East Indies ..	197,303	0.64	174,192	0.68
Australia	146,321	0.48	153,776	0.60
Canada	79,942	0.25	19,768	0.08
British Africa ..	830	—	2.514	0.01
Total	3,052,981	10.01	2,402,303	9.39

Exports to the United States (including Hawaii and Guam) were over 72 per cent. of the total. Comparative exports and percentages of exports for the leading countries were as follows in 1924 :—

Destination	Value £	Per cent.
United Kingdom	2,121,484	6.97
Other British territory	931,497	3.04
United States	22,015,548	72.29
Japan	1,411,190	4.64
Spain	1,002,423	3.30
China	673,751	2.21
Germany	596,126	1.96
France	530,493	1.75
Italy	321,083	1.05
Netherlands	379,554	1.25
Other countries	469,400	1.54

As in the case of imports, the United States is quite preponderant in exports, especially in sugar, coconut oil, hemp, copra, embroideries and cigars. Export percentages to the United States in recent years have been :—

Year	Per cent.	Year	Per cent.
1924	72.29	1921	57.15
1923	70.84	1920	69.62
1922	67.50	1913	34.40

General Trade Conditions

The dominant factor in all considerations of Philippine trade is the free trade relation between the United States and the Islands, American goods coming in free of duty and Philippine goods entering the States similarly exempt. This gives at all times a great advantage to American goods over foreign goods, handicapped by duties averaging in 1924 about 19 per cent. *ad valorem*, and is an important ground for the high percentage of American imports. At the same time, the Islands derive a great proportionate advantage from this free trade system than the United States. Except in hemp, in which the Philippines still have nearly natural monopoly, the important Philippine exports—sugar, copra, vegetable oils, tobacco, lumber, etc.—all meet with competition, and consequently the free entry of these commodities to the States constitutes a most valuable privilege. In 1924 the Philippines took 117 per cent. of all American exports to Far Eastern countries (including India and the Netherland East Indies), notwithstanding the vast disparity in territory and poplation ; similarly, United States imports from these Islands constituted 10.8 per cent. of all imports from the Far East.

[Mr. Thos. Harrington's Report on the Philippine Islands is publishad for the Department of Overseas Trade by H.M. Stationary Office, price 9d. net.]

Improvement of Chefoo Harbor

THE breakwater having been completed in December, 1920 and the mole in December, 1921, it devolved on the Chefoo Harbor Improvement Commission to develop these adjuncts of the harbor in the fullest possible measure, says the Chefoo Customs report for 1925. To secure roads of approach to the mole and land for the Commission's purposes was the first necessity. Great difficulties were experienced in bringing these questions to a successful issue. Negotiations with Chinese landowners, who had not been slow in realising that sooner or later the Commission would have to pay dearly for the omission in previous years to secure land and approaches to the mole, lasted until August. The Commission finally secured some 36 *mow* of land below high-water level to the westwards of and adjoining the base of the mole and a 60-foot-wide road leading to the main street, which besides the existing road leading to the boat harbor, will meet all requirements. The majority of the commercial element at this port having expressed itself in favor of the erection of storage godowns on the mole quay, light steel sheds of the removable type, and measuring 400 feet in length by 60 feet in width, were ordered.

The Commission is furthermore committed, from resolutions passed at various meetings, to establish a system of transportation of goods to and from the mole godowns by means of trucks running on the existing rails ; to construct roads of approach to the main street and to the boat harbor ; to construct a seawall at the base of the mole on the northern boundary of its recently acquired property ; to reclaim this property by filling it to the level of the mole surface and to construct thereon sheds for trucks, workshop, etc. ; to culvert to the sea the creek which empties itself at the base of the mole ; and, finally, when all these works have been completed, to open the mole to traffic.

Other improvements to the harbor, now in course of completion or to be undertaken, are the dredging of the North Tai Ping Wan to a sufficient depth to allow cargo-boats to work at all stages of the tide, and the dredging of the approaches to the jetties and to the mole quay, the latter to a 25-foot depth to permit of the successful berthing of deep-draught ocean steamers at the quay.

The Chefoo Harbor

The tug purchased at the beginning of the year from the Haiho Conservancy is justifying its existence by assisting deep-draught steamers to their berths and by towage and salvage when needed for these purposes. A Priestman grab-dredger, self propelling, fitted with hopper doors, was also purchased during the year and is doing as well as can be expected considering the difficult nature of the soil in the harbor. The appointment this year of a berthing pilot is not only of great material assistance in the berthing of ocean steamers, but also of great moral value for insurance purposes. Thanks, in a great measure, to all these harbor facilities, a direct ocean-steamer traffic is developing favorably.

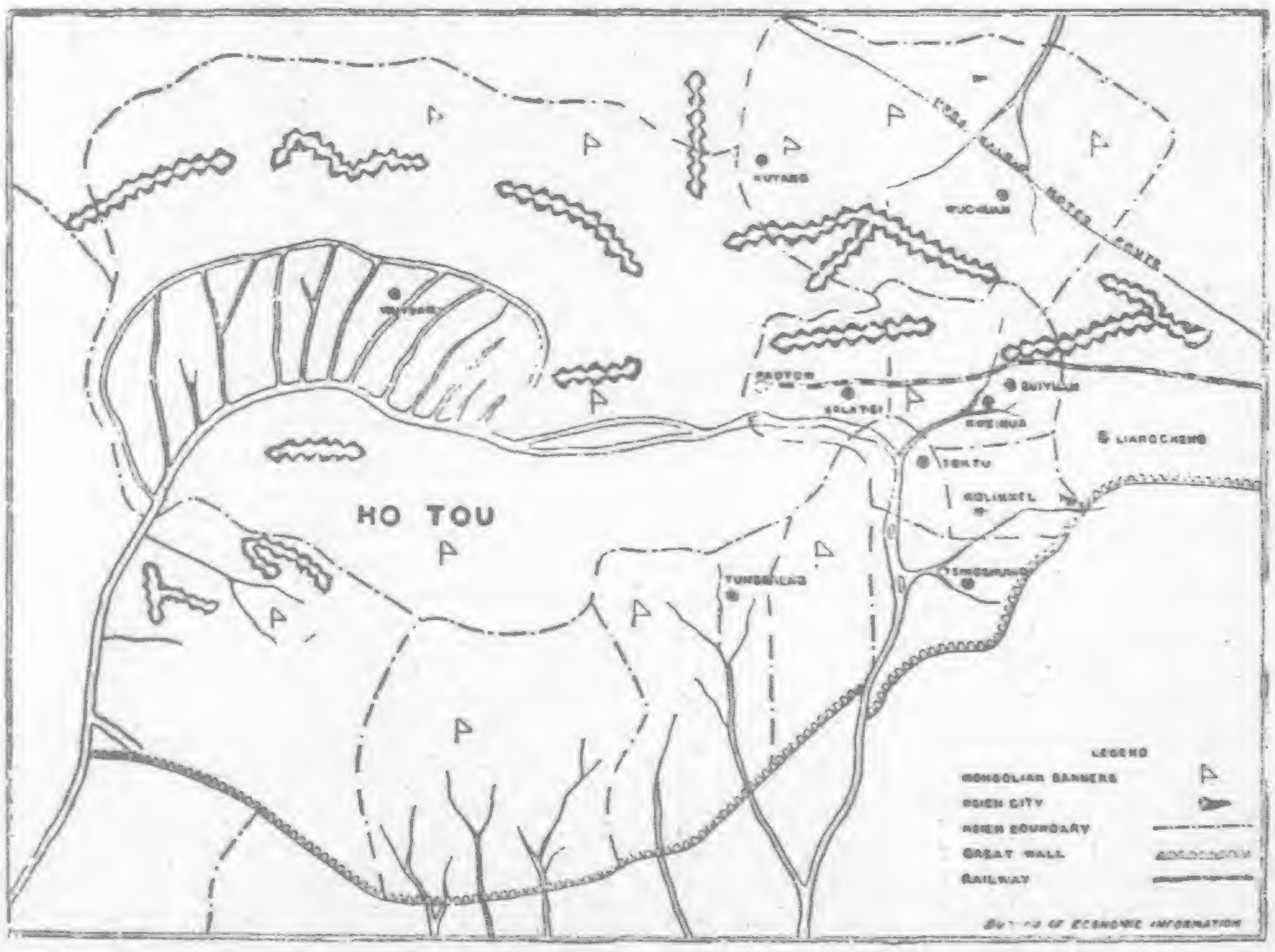
Paotowchen, the Gateway of the Northwest

The Opening of a New Territory

NO city in the northwest is of greater commercial importance than Paotowchen. It is the gateway to Kansu, Mongolia and Chinese Turkestan and commands a hinterland of thousands of square miles. The town is built in the valley of the Taching Shan (Mountains), on the northern bank of the Yellow River, to which the town owes its commercial importance. In former times, Paotowchen was merely a walled market town belonging to the Saratsi Hsien District ; it was raised to the status of a hsien or district and became independent of the Saratsi administration in 1923. The city wall, which was built about fifty years ago, has a circumference of a little over 16 *li* or five and a half miles, with six gates. The northern part of the city is located on the slopes of some neighboring foothills and is therefore subject to periodic torrents in the summer months. The streets are narrow, irregular and, being mud-paved, almost impassable on a rainy day. Mule carts are the only means of transport in the city for both passenger and goods traffic. Considering its commercial importance, the city is rather thinly populated. The residential and industrial quarters are found in the northern section of the city. The south-eastern section is very sparsely inhabited, the bulk of the land being given over to truck gardening. The business or commercial quarter is located in the central section. About four *li* outside the south gate of the city is the railway station and four *li* further south flows the Yellow River, which, at the resent time forms the main artery of commerce between Paotowchen and Kansu province. About a dozen Government offices, including the Magistrate's yamen and quite a number of tax collectorates, are located in the city.

Fifteen *li* away is Nanhaichi, the principal landing wharf on the Yellow River, which serves as unloading point for goods carried down from the various riverine ports in Kansu province. Despite the introduction of railway transportation facilities, Nanhaichi continues to be an important commercial center. A new landing place is, however, now growing in importance at Wang Ta Han Chi, which is seven or eight li to the west of Nanhaichi. The bulk of cargo brought down from Kansu is now unloaded at this new wharf because of its proximity to the railway station. The road from the city to Nanhaichi is in a terrible condition. It has been cut and worn into a deep ditch by the narrow-rimmed wheels of mule carts, and the constant tramping of animals. A broad mud-paved road has been built recently between the city and the railway station and is now kept in good condition by the local authorities, no mule carts fitted with narrowtread wheels being allowed on this road. For extra-mural extension, Paotowchen authorities propose to build a new commercial quarter outside the south gate of the town, near the railway station. A site covering about 10,000 *mow* of land has been laid out for the new quarter, extending from the railway station to Wang Ta Han Chi, the new landing on the Yellow River, in the south, and to the New South Gate of the city in the north. Land in this quarter has been classified into four grades and sold by the officials to the public at prices ranging from $4 to $30 a *mow*. At one time, there was a boom among speculators in the purchase of the land, whose price in some cases went up as high as $100 a *mow*. A few buildings have already been erected in the neighborhood of the railway station, including the premises of the Chung Hwa Flour Mill Co. and the godowns of several transportation companies. Notwithstanding the favorable position occupied by this new commercial quarter, no one is yet able to predict when the plan of its construction will materialise. Up to the present, the officials still hold the scheme in abeyance owing to lack of funds.

The population of the town has been greatly swollen by immigrants since the place was opened to railway communication. Previous to 1922, the total number of inhabitants was between 60,000 and 70,000, but it has now grown to 150,000. The natives were originally immigrants from Shansi province, who settled at Paotowchen about two centuries ago, and these people still retain the habits of simplicity and thrift that characterise most of the Shansi provincials. The new immigrants mostly come from Chihli and Shantung and live on a higher economic plane than the native populace. Residential houses consist usually of one-storey detached buildings with a compound for the accommodation of carts and animals, and surrounded by a strongly fortified wall against robbers and bandits. A *kong* or brick bed, heated in winter time, is found in nearly every house. The buildings of the well-to-do classes are constructed of brick, while those of the poor are mere mud hovels. Rent in the city is exceedingly low, the monthly rate for a *chien* or room ranging from 40 or 50 cents to $3. The clothing of the masses consists of a suit of coarse cotton cloth in summer time and a sheep skin gown in winter. Few, even among the wealthy classes, wear silk or other kinds of costly fabrics. The food of the new immigrants is rice and wheat flour and that of the natives, millet, oat, buckwheat and bean, varied with such cheap vegetable as onions, garlic, pepper and pickled cabbage. In pre-railway days, foodstuffs were extremely cheap. Twenty years ago, a picul of wheat was sold at Tls. 0.90 and a catty of wheat flour, at 16 cash. Even as late as 1917, a dollar could buy 30 catties of wheat flour and a picul of millet was sold at $5. At present, a dollar buys only 18 catties of wheat flour and a picul of millet costs $10.50. With the rise in the cost of living there has been a general advance in wage rates. In 1917, the daily wage of a common laborer without food was about $0.20 but at present it has advanced to $0.30. In the city, numerous inns and lodging houses are provided for the town's laboring classes. The charge for a night's lodging in such hostelries is five coppers, with additional charges for water or tea. Inside the west gate of the city reside the land owning classes, who have bought large tracts of undeveloped land in the rural districts and leased them to immigrants for



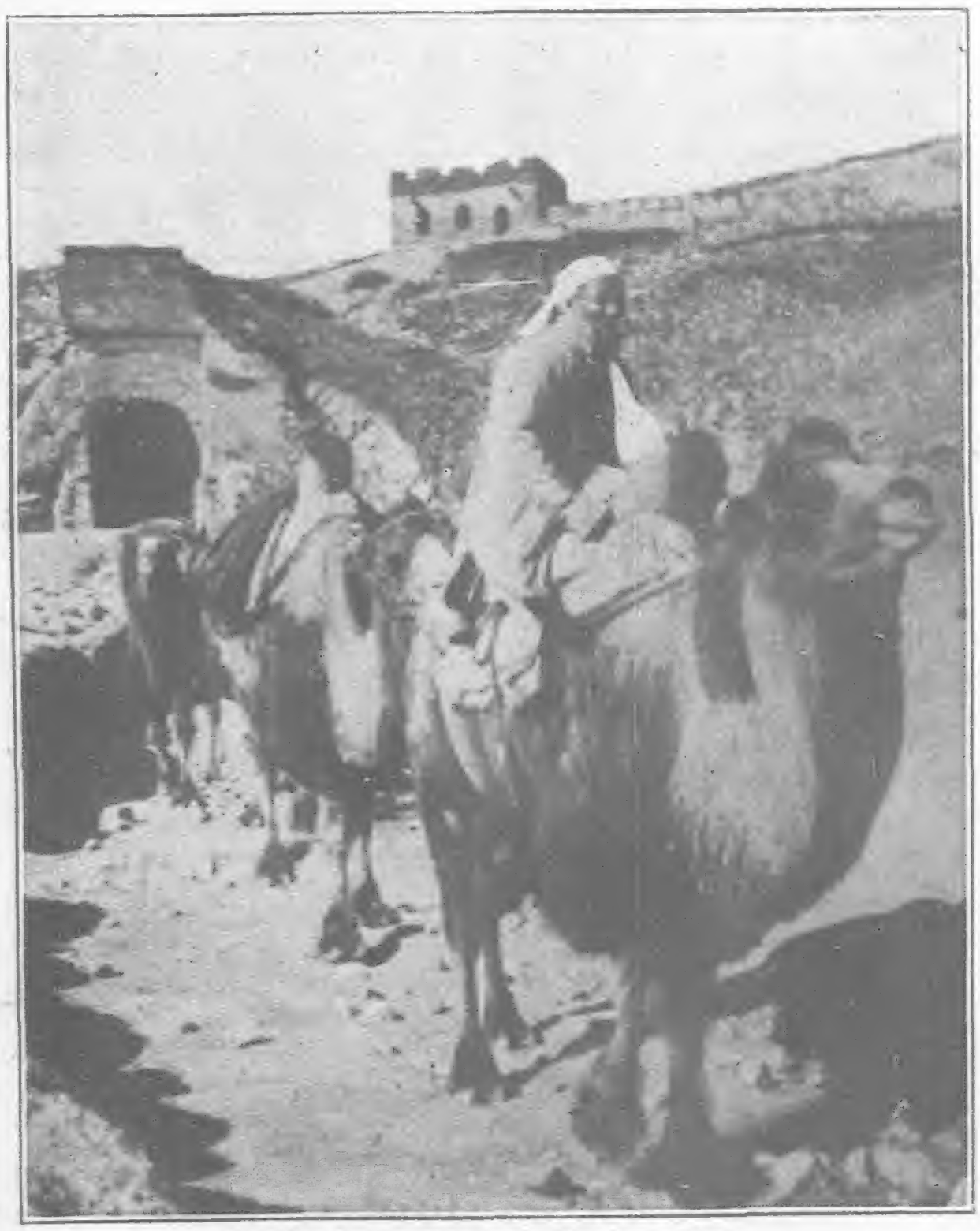
Map of the Hinterland of Paotowchen

reclamation. The estates of the big land owners extend far beyond the Paotowchen district. Some of them own land at Wuyuan, a district to the west of Paotowchen and in the Ordos territory. These landowners lead a life of ease and comfort in Paotowchen in all seasons of the year except the harvest time in autumn, when they occasionally pay visits to their estates and collect rent from their tenants.

Truck gardening forms the pursuit of certain classes of people in the city and the suburbs. Thousands of *mow* of land in the city and the suburbs, being irrigated by the adjoining canals, are devoted to the growing of vegetables. The average yearly yield per *mow* of truck gardens is estimated at about 80 strings of cash, each string in Paotowchen being equivalent to 800 cash.

The farmers in the rural districts are tolerably well-to-do and would feel quite comtented but for the terrors of banditry and the oppression of the soldiery. Tungsheng, a neighboring district, is particularly afflicted by banditry. The farmers living in or near that district have to take refuge at Nanhaichi every autumn after the gathering of their crops.

The most important merchants in Paotowchen are cereal dealers, skin and wool exporters and the Mongolian and Turkestan trading firms. The bulk of such business is in the hands of Shansi merchants; they were the earliest immigrants into Paotowchen. Of the 25 skin and wool exporters operating in the city, the Kwang Heng Hsi and Kwang Yi Heng are the biggest. Some of these establishments are also engaged in importing from Mongolia live stock such as horses, sheep and cattle. Of the cereal dealers, there are 29. Their business is confined to the collection of grain from the farmers which they export or sell locally. Kwang Sun, Fu Shun Hsi and Tung Ho, are the main dealers. The trading firms are divided into: (1) Mongolian trading firms and (2) Hsi Chwang, or those engaged in trading with Kansu and Chinese Turkestan. Both export Chinese manufactures into Mongolia or Turkestan and barter them for wool, skins and animals from these lands. There are 21 Mongolian trading firms and seven Hsi Chwang in Paotowchen. Next in importance is the Hu Tien; this class of merchants partake of the nature of both commission agents and inn and warehouse keepers. Each of them usually keeps a very large house, in which they provide living quarters for their clients and godowns for their goods. They maintain a staff of canvassers to bring together the buyers and sellers and to watch market conditions. Exporters of brick tea, cloth, sugar and paper from the interior to Paotowchen generally go to such commission houses. They pay the agent not only commission for the business transacted but also rent for their lodging and godown facilities. Nineteen of such commission houses are operating in Paotowchen.



Camels Going Through Nankow Pass

Dealers in sundries form another important class of merchants in Paotowchen. These dealers sell various kinds of manufactures exported from the interior, including cloth, silks, tea and porcelain wares. They may be divided into two classes: (1) the old class, composing mostly Shansi traders who went to Paotowchen in the early days and (2) the new class, consisting chiefly of merchants from Tientsin and Peking, who started business in the city only after its opening to railway communication. The Shansi dealers have had long and extensive business connections with their Mongolian customers. Their shops can be distinguished from the other class by the Mongolian characters which they inscribe on their sign boards side by side with the Chinese. The premises of a Shansi dealer are far from being pretentious, but the shop, as a rule, is well-financed and well-stocked.

The transportation business in Paotowchen are divided into (1) railway transportation companies and camel caravan transportation companies. Of the latter, there are about 30, each having a herd of camels for transportation service, varying from a score or two to 700 or 800. Their field of enterprise covers practically all the important commercial centers in Mongolia, Kansu and Chinese Turkestan. They organise an association known as Ma Wang She. Of the railway transportation companies there are 11, divided into a few groups, each being engaged in transporting certain particular kinds of commodities, such as cereals, cloth and skin and tobacco. Other classes of merchants worthy of mention are the 15 drug dealers, one timber yard and nine fruit dealers.

The industrial pursuits of the city are not yet beyond the handicraft stage. With the exception of the Chung Hwa Flour Mill Co. and a few soap factories, there are no other industrial works. The flour mill was started by a group of Shantung capitalists with an authorised capital of $600,000, of which $300,000 has been paid up. It is equipped with 14 roller mills ordered from America and is capable of turning out 2,000 bags every 24 hours. Its premises, situated outside the city, near the railway station, cover an area of 26 *mow*. The three soap factories are Chi Ching Kung, Chiu Shih and Ching Mei, all located in the city. The daily output of each of these works varies from 720 pieces in the case of Chi Ching Kung, to 3,000 pieces, Ching Mei, and 4,000 pieces, Chiu Shih. The bulk of the soap is of the common variety, toilet or scented soap being turned out in only a limited quantity. Tallow is abundantly produced in the city but up to the present is consumed only in the local factories in making old fashion candles.

Among the various kinds of old style industrial pursuits, those worthy of mention are the carpet and rug weavers, tanneries, skin curers, oil mills, dye-works, glue makers, native flour mills, breweries and distilleries. The carpet and rug manufacturers, numbering in all about forty, form an important branch of the city's industrial life. The Yung Mow Kung, the largest factory, employs 70 hands and the Ping Yi Ho has 60 hands. The remainder of the establishments are running on a more limited scale. The craft of carpet weaving was introduced by the local manufacturers from Yuling, Shensi province, and Ningsia, Kansu province. There are over 400 weavers engaged in this trade in Paotowchen. Of the 30 odd tanneries, only a few are capable of turning out leather approaching modern standards, the rest being engaged in preparing low-grade leather, consumed principally in making Mongolian high boots, saddlery and harness, etc. The skin curers, of which there are about 50, confine their business to curing the skins of sheep and other animals. The oil mills are equipped with old style wooden presses, their principal product being sesamum and linseed oil. Owing to heavy taxation and other causes, the products are seldom exported to any distant market, the bulk being consumed locally. The dye-works in pre-railway days prepared their dye-stuffs from the native grown indigo but now they have taken to the imported kinds. The business is fairly good, owing to the ever increasing

local demand for the dyed coarse native cloth. There are four glue makers, who turn out glue of the yellow variety, sold at $0.20 a catty on the local market. Paper is made from discarded hemp ropes and other kinds of grass by quite a number of manufacturers. The product is of inferior quality and supplies the local market only. There are 20 old style flour mills, turning out flour of very poor quality. The mills are all worked by draft animals. In the Tsing dynasty, three mills were operating outside the city by water wheels, but this has been found unprofitable in view of the fact that the Octroi or some such levy imposed on the wheat and flour at the city gate offset the advantages gained in utilising the water power. These mills have all been closed.

Merchants and artisans of the same trade in Paotowchen often organise among themselves a *hong* (guild) or *she* (union or association). Sometimes, merchants of the allied trades organise themselves into one body. The *lu chen hong*, for instance, is composed of flours mills, breweries and oil mills. The Paotowchen Chamber of Commerce is organised by nine *hong* and 16 *she*, each representing a particular trade or a number of trades. Of the nine *hong*, there are those of the fur and skin dealers, oil and cereal dealers, the sundry dealers, native banks, pawnbrokers, commission houses, flour mills, breweries and oil mills, Mongolian trading firms and live stock dealers. The 16 *she* represent the metal smiths, carpenters, restaurants, tanneries, skin curers, shoe makers, carpet weavers, blanket manufacturers, dye-works, dry goods dealers, timber dealers, beancurd manufacturers, butchers, fruit dealers, painters, and inns and lodging houses.

Wool, skins and cereals form the most important exports of Paotowchen. Wool and skins are collected from Mongolia, Kansu, Kokonor and Chinese Turkestan. In the case of wool, Mongolia contributes a greater quota than any other source but in quality the wool crops produced in Kansu and Kokonor are far superior. The yearly import figures of wool and skins into Paotowchen from these lands are roughly estimated as follows : 10,300,000 catties of various kinds of sheep wool, 1,600,000 catties of goat hair, 5,000,000 catties of camel wool, 100,000 pieces of lamb skin, 200,000 pieces of sheep skin, 50,000 pieces of goat skin, 10,000 pieces of fox skin, 2,000 pieces of wolf skin and 50,000 pieces of cow hide. Several foreign firms have agents in Paotowchen to collect wool. Uncleaned sheep wool is always adulterated with a considerable quantity of dirt and other impurities. Upon buying the wool, the collectors usually allow a fair discount to cover any loss due to these impurities. The foreign agents, representing certain firms in Tientsin, undertake to have the wool washed and cleaned, before being packed and shipped.

Paotowchen is also a collecting center for liquorice and other kinds of drugs produced in Kansu and Ordos territory. In pre-railway days, most of the shipments of liquorice were exported *via* Hokow, a port on the Yellow River, 240 *li* below Paotowchen. At present, most of the shipments destined for foreign markets are collected in Paotowchen and transhipped to Tientsin. The shipments for the home market are forwarded to Yuchow, Honan province. Liquorice is classified into half a dozen grades according to size or quality. *Ta tsao*, with well-developed roots, ranks first, *er tsao* comes next. *Feng tsao*, *tung tsao* and *hwan tsao* are inferior grades. The market prices for liquorice of various grades last year ranged from Tls. 8 to Tls. 16 a picul. About 60 per cent. of the shipments exported by Paotowchen is produced in Kansu and the remainder in the Ordos territory. About 20 liquorice collecting firms are operating in Paotowchen. The merchants obtain stock by sending out agents to the various producing centers and collecting and shipping the cargo to their headquarters at Paotowchen for transhipment. Those who are engaged in the business must obtain a license from the Suiyuan authorities for collecting liquorice. The license fee varies from $8 to $30 according to the amount of the dealer's working capital. In addition to this charge, the dealer must also pay $6 for a license permitting the holder to ship liquorice to Paotowchen from the hinterland. These licenses are subject to yearly renewal. Owing to the exhaustive gathering of the plant in recent years, the product has deteriorated in quality and the supply is running short. Suiyuan officials are trying to induce the people to raise the plant by artificial means instead of gathering the wild crops. A liquorice experiment station has been established at Luan Shui Chun Chih, to the west of Paotowchen, to raise liquorice crops by artificial means. (cf. article : "*Liquorice Digging in the Ordos*," *Bulletin No.* 201, *pp.* 1—3). Among other kinds of drugs collected in Paotowchen are *Fritilaria verticillata*, *Lycium chinense*, ibex horns and deer's horns in velvet. They are produced in Kansu, Chinese Turkestan and Mongolia and are mostly transhipped to Kichow, Shansi province, and Yuchow, Honan province, for the home market. Lanchow tobacco use to be exported to outside markets by Shensi, but in view of the unsettled conditions in that province, is now forwarded to Paotowchen by the Yellow River. The annual figure is estimated at 40,000 chests, each weighing from 160 to 200 catties. Salt produced in Alashan is also imported into Paotowchen in large quantities. Crude soda produced in the Ordos territory also finds an outside market through Paotowchen. The soda is obtained from the alkaline lakes in a free state. Exporters who work the soda deposits must obtain a permit from the Suiyuan officials, the product at Otok being of the best quality. It is consumed chiefly in bread making and the manufacture of soap. About 50,000 piculs of soda are yearly imported into Paotowchen, a picul at the place of production being sold at $1.50.

Mineral Products

The best known coal field in Paotowchen neighborhood is at Shihwakou, about 60 *li* from the city and is under the administration of Kuyanghsien. The coal field covers a total area of 60 square *li* and contains rich coal deposits. The pits which are being worked by certain companies are quite free from floods or fire damp. The coal is of the bituminous variety and contains a very low percentage of sulphur. It is suitable for steamer and train boilers and for industrial works. The pits at Tungkwanyao are now worked by the Mo Nan Co., and the Chi Chang. Primitive methods are employed. The pits at Hsikwanyao have been farmed out to the local miners. The miners work in shifts, and are paid 120 coppers with free board for every twenty-four hours of actual work. The producing cost of coal is about $2.20-$2.30 a ton and the output is sold at the pit head for less than $3 a ton. Owing to transportation difficulties, a ton of coal brought to Paotowchen costs $5-$6 for freight alone and is sold on the Paotowchen market at $10. Under existing conditions coal produced in this neighborhood is brought to Paotowchen by either mule carts or pack mules, and the cost is very high in spite of the short intervening distance. Rubies and other precious stones are produced in certain quarries at Hunghwa Ertuhla and Hailingho, about 300 *li* to the northwest of Paotowchen. Asbestos mines have been discovered at Hsiaosheta, Kumtulun and Houkouchih, about 180 *li* to the west of Paotowchen. A kind of white clay produced at Chaochunwen, 60 *li* to the southwest of Paotowchen is used to good advantage for starching clothing and plastering walls.

Means of Communication

Notwithstanding the operation of train and motor bus services in Paotowchen and its neighborhood in recent years, the Yellow River still forms an important artery of commerce in those regions. The section of the river from Wufangssu, a landing place below Lanchow, Kansu province, to Hoku, Shansi province, is navigable by various types of flat-bottomed crafts or timber and skin rafts. From Lanchow to Hoku, the river may be divided into sections according to the nature of its bed : Lanchow to Wufangssu, 500 *li*, rocky bed, with several dangerous gorges and rapids, navigable only by skin and timber rafts ; Wufangssu to Chungwei, 260 *li*, rocky bed with two gorges at Shapa but easy to navigate in other parts, Chungwei to Ningsia, 546 *li*, river bed partly sandy and partly rocky, with one rapid at Pataichia, 260 *li* above Ningsia, from Ningsia to Tengkow, 403 *li*, rocky bed, with swift currents but free from gorges or rapids, from Tengkow to Nanhaichih (Paotowchen), 949 *li*, sandy bed, body of river broad and placid with the exception of a few difficult points above Tuchengchih, about 600 *li* above Paotowchen. Below Paotowchen, the river is navigable for ordinary boats for a distance of about 440 *li*, where the river enters the Shansi plateau at Hoku, Shansi province.

Three types of native crafts specially designed for negotiating the rapids in the upper reaches of the Yellow River are plying between Paotowchen and the various ports further up the river. The *kaoponchuan* is a flat bottomed boat, 38-40 feet from bow to stern with a beam of 14-15 feet, drawing three feet of water and capable of carrying 300 piculs deadweight ; the *tsitsaichuan* is of about the same length but three or four feet broader than the *kaoponchuan*, drawing 3.5 feet of water, having about the same carrying capacity. The *siaowutsai* is practically of the same type as the *kaoponchuan* but smaller in size. The *kaoponchuan* and the *siaowutsai* ply

between different sections of the river from Wufangssu to Hokow, Shansi province, while the *tsitsaichuan* confines its sailings more or less to the section between Ningsia and Hokow. Going up the river, these boats can cover 40-50 *li* a day ; in coming down, the speed varies from 80 to 130 *li* a day according to the swiftness of the currents. In summer time especially, the boats carry up river such cargo as cloth, sugar, tea bricks and other manufactures from Paotowchen to Wufangssu and bring down tobacco, wool, salt, soda and other raw materials on their return trips. It takes about one month to cover the distance between Ningsia and Paotowchen on the up river trips, when the boat must be towed against the swift currents of the river. On the down river trip, the same distance can be covered in 18 days. A boat can make only three return trips from Paotowchen to Ningsia every year. There are about 5,000 such vessels plying between Ningsia and Paotowchen. These boats are simply and rudely constructed, the bottom generally being built of poplar, each costing only a little over $100. In Lanchow and further above, the local inhabitants use timber or skin rafts to negotiate the gorges and rapids of the Yellow River. The skin rafts are made of inflated cow or sheep skins, usually 80-120 of such skins being fastened together to form one raft. When the timber rafts are floated down to Paotowchen, the raftsmen sell not only the cargo they carry but also the timber with which the rafts are made.

The section of the Yellow River between Lanchow and Paotowchen is ice free for about eight months of the year. From the latter part of November to the end of March, the river is ice bound. The section between Wufangssu, Kansu province, to Hokow, below Paotowchen, Shansi province, is navigable for steam launches during the high water season. For the past fifteen or twenty years, several attempts have been made by the local officials to open the river to steam navigation. At present, the Paotowchen authorities are renewing the enterprise by importing a shallow-draft steam vessel for a trial trip. (In his down river trip from Lanchow in 1917, Mr. Eric Teichman noticed a small stern-wheel steamer lying rusty in the neighborhood of Chingchi, Kansu province. The derelict represented one of the early attempts made by the Viceroy of Kansu in the Manchu dynasty.

In regard to overland travel, a number of caravan routes radiate from Paotowchen to different parts of Mongolia, Turkestan and Kansu. The Paotowchen-Urga route covers a total distance of about 2,000 *li*, through a steppe country with some intervening stretches of sandy desert. The route is a beaten track, travelled for ages by mule carts and camel caravans. From Paotowchen to Kobdo or Uliassutai, in North-west Mongolia, the road follows the Paotowchen-Urga caravan route until it branches off at Sairussu in a north-western direction and then follows the former Imperial Courier Route to Uliassutai, from which place it continues in a north-western direction to Kobdo, also following the former imperial courier route, through a steppe country, where water and fodder can be obtained at any place. The going is easy ; some patches of salt and alkali swamps render wheeled traffic difficult, but only at a few places. Traders journeying in those regions generally use camel caravan. From Paotowchen to Chinese Turkestan, camels are also employed. The whole journey from Paotowchen to Kitai, Chinese Turkestan, is divided into a little over 60 stages. From Paotowchen to Wuyuan and Ningsia, motor buses now take the place of camel caravans, the total distance being about 1,300 *li*, and divided into three sections : (1) Paotowchen to Wuyuan, 420 *li*, covered by motor bus in eight hours, passenger fare, $12 per capita, (2) from Wuyuan to Tengkow, 445 *li*, fare, $18 and (3) from Tengkow to Ningsia, 420 *li*, fare, $15. Besides this motor road, there is a cart route from Wuyuan to Paotowchen, lying to the north of the Wula Shan Mountains. This is a busy thoroughfare for goods traffic specially in winter months, when the Yellow River is ice-bound. The distance is about 380 *li* and is covered by mule cart in six days. From Ningsia to Lanchow the route runs through a level country until it reaches Chungwei. From that point on to Lanchow, the last few stages of the journey are exceedingly difficult because of the high passes and desert stretches. This route is taken by caravans only in winter months. Camel caravans travelling between Paotowchen and Lanchow usually prefer to take a route farther north of the trade route referred to above, the reason being that they can obtain fodder for the caravan animals more easily in the Mongolian steppes. From Paotowchen to Sining, Kansu province, the route runs through the Ordos territory, a steppe country, where water and pasturage can be easily obtained for both men and animals, only certain stretches of sandy desert rendering wheeled traffic difficult.

The following passage, quoted from Mr. Eric Teichman's *Travels in North-West China*, is a general description of Paotowchen, which he visited in 1917 on his return from a tour to Shensi and Kansu :—

" Paot'ou Chen (Paotowchen) is a large-walled town lying a little way back from the Yellow River in the corn-growing plains which slope up towards the Tach'ing Shan, a continuation of the Wula Shan. It is remarkable in many respects ; in the first place, it is essentially a new and growing place, unlike the dilapidated and hoary old towns of Kansu, and is the center of a fertile corn-growing area which a generation ago was unoccupied except by a few Mongols and their flocks. There is probably plenty more good land waiting to be opened up further west, North of the Yellow River, and the curious spectacle may here be witnessed of the Chinese colonising Canadian-like prairies within the borders of their own republic. Secondly, as well as a cleaning and repacking center for the Tientsin wool trade like Shihchu Shan, it is evidently a commercial center of considerable and increasing importance for the import and export trade of the vast hinterland to the west. We found more evidence of trade activity in this isolated town than in any city in Kansu. Unfortunately, situated as it is on the very outskirts of Chinese civilization, Paot'ou appears to have suffered greatly from the prevailing lawlessness of the past few years, which fact, however, only makes its commercial prosperity all the more remarkable. It evidently owes its importance to its position as the most westerly outpost of Chinese trade in this direction, and like Kueihua Ch'eng, is one of the starting-points for caravans going west. The Mahommedans appear to form an important element of the trading community. There was no civil official at the time of our visit, but a large garrison of soldiers ; the inhabitants seem a rough lot, as is to be expected in a frontier town."

Largest Twin-Screw Motor Yacht Yet Built

CONSIDERABLE interest attaches to the launching of the *Eros*, which took place on March 2, from the yards of Messrs. Ramage and Ferguson Ltd., of Leith, in that it is believed to be the largest vessel of its class ever launched, and certainly the largest in Britain. She will form a notable addition to the ever increasing number of yachts that are fitted with Diesel engines, and in these days of world wide travel is quite likely to be seen on all the seven seas of the world.

The principal dimensions of the *Eros* are :—Length overall 214-ft., breadth moulded, 32-ft., depth, moulded to main deck, 18-ft., and tonnage 914 tons Y.M. She is of an awning type deck, with good height between the main and awning decks, with cruiser stern of special design and modified cruiser stem.

The hull is of steel and constructed to Lloyd's 100 A.1., class for yachts. The deck is flush, giving an unbroken sheer line with rails and stanchions all fore and aft instead of the usual bulwark, thus giving the vessel a much lighter appearance.

A long composite deckhouse with teak framing and panels is erected on the awning deck extending about 105-ft. amidships, which contains the owner's office, vestibule, captain's room, deck shelter, etc., and supports a bridge and boat deck extending the same length. On the bridge deck, at the forward end is constructed a teak deckhouse containing pilot room, chart room, and wireless room.

Entering the starboard gangway door on the main deck the forward lounge or main vestibule is reached, which communicates with all other rooms on the vessel, and a cloak room is arranged at the after end of the lounge. The large dining room, which extends for the full width of the vessel, is entered through double doors at the forward end of this vestibule, and will be framed and panelled in sycamore inlaid with silver. A long wide corridor along the starboard side leads from the after end of the forward lounge to the after lounge, providing ample room for promenading. The two lounges, with corridor are to be panelled with sycamore.

The after lounge gives access to the drawing room (panelled in sycamore), and from there to the smoke room, panelled in Amaranth inlaid with ebony ; both these rooms extend for the full width of the yacht. The lounge also gives access by a stairway leading to the cabin sole to a centre line corridor, on either side of which are arranged eight guests' staterooms and four bathrooms. A bed with drawers under, a settee for converting into a bed, dressing table, wardrobe, wash-basins, folding arm chair, and an electric fan are provided to each cabin.

The deckhouse on the bridge deck, with a semi-circular front, contains the chart room and the pilot room, complete with the usual fitments; a wheel with telemotor control to the steering gear, binnacle, and automatic steering pilot machine, embodying a steering repeater compass. Outside are the standard compass, two repeater compasses, engine room and docking telegraphs, and a searchlight on each side of the bridge arranged so that the beam can be thrown along the ship's aft side as well as forward.

The after position of this deckhouse is taken up by the wireless room, and in connection with the installation a direction finder is arranged with indicating instrument in the wheel house.

There are two main Diesel generators for providing electricity for lighting the vessel as well as for the steering gear, windlass, capstans, boat hoist, and refrigerating plant, all of which are electrically driven, and in addition, the wireless, two search lights, mechanical ventilation, sundry pumps in the engine room, and the master gyro compass. An auxiliary electric generator is also provided for lighting purposed only, and a large battery comprising 100 cells having a capacity of 2,000 ampere hours being the largest battery ever fitted on a yacht.

The heating system boiler, located in a separate compartment on the main deck forward of the engine casing, entered from the engine room, is an oil-fired steam boiler which provides hot water for the radiators and for the supply to baths, wash basins etc., by means of calorifiers in the engine room.

As previously stated the deck auxiliaries will be all electrically driven. The steering gear is of Williams, Janney, Brown, electric hydraulic type with telemotor control to the gear of the bridge. The anchor windlass and two warping capstans driven by electric motors and the electric boat hoists were made by Reid of Baisley. The refrigerating plant is in a separate compartment at the forward end of the engine room casing, and consists of a West's 1 S.V. type direct coupled N.H. 3 compressor, and multitubular condenser and large insulated chambers are provided for the storage of provisions.

Ventilation to the state rooms, etc., is obtained by a Thermotank unit, which will have a capacity for heating the air from 15 degrees to 20 degrees above that of the atmosphere, and the trunking has been arranged so that it is as inconspicuous as possible.

Oil fuel is carried in the double bottom, which extends almost the full length of the ship.

A Brown's master gyro compass is fitted with two repeaters for either side of the bridge, and an automatic steering pilot machine for the wheelhouse, in addition to the usual magnetic compasses.

The propelling machinery consists of two sets of Burmeister and Wain, Copenhagen, direct reversing four-cycle trunk type Diesel engines, each set having six cylinders and a collective B.H.P. of 1,600 at 310 revolutions per minute. Each engine drives its own air compressor, cooling water pump and lubricating oil pump, also bilge, sanitary, and oil transfer pumps.

Two Burmeister and Wain four-cycle two-cylinder forced lubrication Diesel engines are fitted each with combined injection and manoeuvring air compressor and direct coupled to a 66 k.w. generator.

A Challenge to Oil

High Pressure Steam for Ship Propulsion

THE dwindling oil reserves of the world raises the problem of future fuel supplies for modern power and transportation requirements and unless improvements or invention give a new turn to the existing craze for petrol consumption, disaster looms ahead for many industries which have pinned their faith to the internal combustion and Deisel engines. For many years scientists and inventors have been seeking to discover and develop a new liquid fuel that will supplant petrol, but so far without commercial success. The extraction of oil from shale may eventually be brought to a paying basis, especially if the present depletion of the supplies of natural oil, and an increasing consumption combined with higher prices wipes out the unfavorable margin of production costs. This may prolong the petroleum fuel era indefinitely and establish the Deisel engine as the most economical producer of power. The challenge involved in this contingency is being met by the engineer combining higher steam pressure with air pre-heating, superheating and other improvements that will enable coal to retain its supremacy as the world's main power producer.

This principle has been successfully worked out in the latest electric power stations but its first application to ship propulsion has been undertaken by Messrs. William Denny Brothers, Limited, in combination with Sir Charles Parsons, the turbine inventor in the construction of a new Clyde excursion steamer for the Turbine Steamers, Ltd, to ply on their river and first runs in Scotland. The new vessel represents the latest challenge of steam to the oil engine as an instrument for ship propulsion, seeking to show that an increase in steam pressure, superheating and air pre-heating will enable the turbine steamer to operate at a cost even lower than the Diesel engined vessel, with the added advantage of preserving the turbine with its economy of space and of burning coal, a most essential qualification for British steamers dependent on the national fuel supply.

The experiment is being watched with keen interest in Great Britain, as one of the results of success and its general application to other vessels, is to give coal, the one fuel of which England has abundant stores at home, a new lease of life and provide an expanded domestic demand that will offset the loss of foreign markets. The difficulties in maintaining an adequate supply of oil as fuel for the British navy and merchant marine during the war at times gravely jeopardized the efficiency of the Grand Fleet, completely paralyzed the movements of many of their merchant vessels dependent upon oil engines, and seroiusly interfered with the importation of essential food supplies. So the success of the new Denny-Parsons venture means more to Great Britain than a mere victory of steam over oil, Japan, with her lack of oil deposits will also be as deeply interested in the success of this new venture as Great Britain, and it is safe to say that with their well known spirit of initiative and progressiveness, Japanese shipbuilders and ship owners will lose no time in putting the idea to the test in the construction of new steamers.

Speaking at the launching of the *King George V*, Sir Charles Parsons said that the time had arrived when, the Diesel engine's challenge in its alleged economy in working should be met, when they should put their shoulders to the wheel and do their best with steam. "The *King George* is our reply," declared Sir Charles, "and we think its engines will be run a good deal more economically than the oil engine. We should have liked to have gone to higher pressure than 500-lb. to the square inch in this vessel, but we were afraid of frightening people."

The new steamer marks yet another progressive step in the development of marine propulsion, introducing Sir Charles Parsons' latest proposals in regard to the increased thermal efficiency obtainable with higher steam pressures and temperatures. As the steam pressure is considerably in excess of previous practice in marine work, these new proposals are of great importance and interest to the marine engineering world at the present time. The machinery for the vessel comprises a two-shaft arrangement of geared turbines to develop 3,500 s.h.p., designed for a boiler pressure of 550 lb. per square inch, and a total steam temperature of 750deg. F. The steam will be generated in two watertube boilers of the Yarrow type, constructed by Messrs. Yarrow and Co., Limited, of Scotstoun, Glasgow, and will be fitted with superheaters and air preheaters. The condensing plant is designed for a high vacuum, is of large total capacity and sub-divided into sections, with means to isolate each section both on the steam and water side, thus providing ready means for overhaul in the event of leaky condenser tubes and a safeguard against admission of salt to the feed system. The steam for the auxiliary machinery will be supplied at a reduced pressure of about 200-lb. The auxiliary exhaust steam will be utilized for heating the feed water to about 200 deg. F., but the temperature of the feed water will be increased to about 300 deg. F. by steam tapped off from a suitable stage in the turbines.

Insurance in the Far East

Use of Chinese Agents

By P. W. F. Mills

INSURANCE in North China, and also in Hongkong and South China, is usually transacted through companies' branches, or representatives, at the various ports, or through shipping or trading firms holding powers of attorney for one or more companies. "Tariff" companies, in the persons of their representatives or agents, are members of the Fire Insurance Associations in Shanghai, Hongkong, Hankow, and Tientsin. They also observe the rules for the conduct of business laid down in respect of such ports as Swatow, Tsingtao, Amoy, and Chinkiang by the Fire Offices Committee (Foreign), this body being the parent committee of those formed by the local associations.

All Far Eastern tariffs, whether they originate from London or local insurance centers, draw important distinctions between "foreign" and "Chinese" business, rates differing greatly and definite regulations regarding the allowance of discounts and brokerage in respect of "Chinese" business being enforced. No difficulties arise in connexion with the foreign sections of the various tariffs; no discount or other return to the insured party is permissible; and if remuneration to native brokers should be necessary in respect of business which falls for rating under a foreign scale, the rate is "loaded" accordingly.

The Brokerage Question

The brokerage question, as it affects business rateable under the Chinese scales, presents a number of difficulties, and has attracted more discussion than any other problem in Far Eastern insurance. is unquestionable that a regulation limiting brokerage places non-tariff competitors in a favourable position to underquote by comfortably small margins, and it is widely held at the present time that limitation of brokerage by tariff is wrong in principle, as having the effect of preventing signatory companies or their representatives from quoting net rates in respect of Chinese risks on the basis of their appreciation of the hazard and their loss experience in the class of risk. Both the Shanghai and Hongkong tariffs now permit "unlimited brokerage" in respect of Chinese insurances.

It is necessary to understand the methods by which insurance business is obtained in Hongkong and China before the confidence of the Chinese in British insurance companies, and the effect on these companies of the recent disturbances, can be fully appreciated. It is clear that the simplest method of obtaining lines on mercantile and industrial risks in foreign control is by the appointment of large foreign firms as agents or sub-agents, and this method has the additional advantage of securing a ready-made organization for development. A great many firms have representatives in all the large and most of the small ports, and, by ensuring that all Chinese business offered to them comes from sources approved of by their associates, a large and profitable account may be formed in the course of a few years. Very satisfactory results have been achieved in a number of cases from Chinese agents in the more important inland centers, the local Chinese quickly perceiving that they are afforded fuller protection by reason of the practice of the companies in writing business only at adequate rates and with a wise regard to area liabilities.

British Prestige

The ideas of the Chinese trader in a small city are happily so formed that a local man well known for his integrity as a merchant and an insurance agent may possess an influence which results in a very small moral hazard as regards his policy-holders; and the certainty that gambling has no place in the practice of British companies adds to the feeling of security. A high level of fairness in the matter of claim settlements has established British companies in a position which has been a very great asset to them in meeting the severe competition of recent years. Late-comers into the field, unwilling to establish large organizations on their own account, and faced with the problem of discovering suitable agents among concerns whose arrangements as regards insurance are not already made, naturally direct their energies towards securing shares in a few of the larger risks; and by offering special terms succeed in displacing more important companies. As a result of the recent "anti-Imperialist" boycott, successes of this kind have been slightly more frequent the nature of the risks from the aspect of the class of person likely to have in his hands the "placing" of the insurance making this inevitable. It is true to state, however, that the steady development of confidence in British companies is receiving no more than a temporary setback.

Risks are usually classed as wharf, mercantile, industrial, domestic, and retail. These distinctive class names indicate the nature of the risk for tariff-rating purposes. The construction of buildings varies considerably in type and quality throughout China, but reinforced concrete is increasing in popularity,even outside the large ports, and an increasing number of buildings are of specified fire-resisting construction. Sprinkler installations, fire-doors, and fire extinguishing appliances on a large scale are becoming more frequent in godowns, these forming a large proportion of the risks underwritten, as the term "godown" may be applied to all buildings used solely for storage purposes.

Earthquakes and Typhoons

In North China it is not usual to insure buildings against earthquake shock damage or fire resulting from earthquake, and insurance against damage by typhoon is seldom considered necessary. In Hongkong and South China, however, all these three risks are not such remote contingencies, and protection against them is commonly provided by the British companies.

Marine insurance in the Far East presents no special features. Discounts and other deductions apply to all "Chinese" business, and a number of systems of premium payment operate in Hongkong to defer settlement of Chinese premium accounts until the New Year in China. The practice is not without its critics; but there is a feeling in some quarters that these methods are of service from the point of view of the companies, inasmuch as they place competitors for marine business on an equal footing. Were monthly premium settlements with Chinese to become a tariff obligation, allowance of credit for longer terms might serve as a lever for influencing business in the hands of free-lance competitors.

New Holt Motorship

On Wednesday, April 14, Messrs. Workman, Clark & Company, Limited, launched from their North Yard, Belfast, the motorship *Orestes*, built to the order of Messrs. Alfred Holt & Co., Ltd., of Liverpool.

The vessel's dimensions are :—Length 475 feet, beam 58 feet, depth to upper deck 35 feet 3 inches, with a load displacement of over 15,000 tons.

There are six cargo holds arranged to give the maximum of space for bulky cargoes, machinery, etc., including two holds and 'tween decks fitted for the carriage of refrigerated meat, provisions, and fruit cargoes.

The propelling machinery consists of twin sets of 8 cylinder Burmeister and Wain 4 stroke Diesel engines, developing 6,000 s.h.p. for a speed of over 15 knots. To provide the necessary current for driving the electric winches, electro hydraulic steering gear, windlass, engine room auxiliaries, electric cooking appliances, and the lighting of the vessel four large dynamos are provided coupled direct to Diesel engines of the Burmeister and Wain type.

Development and Character of Japanese Business

By J. W. Ballantine

THE special conditions which prevail in all branches of Japanese business are generally very difficult for American manufacturers or exporters to understand and are frequently the cause of considerable wasted effort in attempts to reach the Japanese market. These features are, to a large extent, the results of the evolution of Japan's Commercial System.

Four Periods in Evolution of Company Enterprises

The transition from the feudal to the capitalistic system in Japan dates from the restoration of the temporal power of the Emperor in 1868. The evolution of Japanese business may be divided into four periods :

1. The transitional stage, in which the foundation of the modern business organization was laid from the Restoration in 1869 to the Sino-Japanese War in 1894.

2. The first period of modern development—from the Sino-Japanese War (1894) to the Russo-Japanese War (1904).

3. The second period of development—from 1904 to the beginning of the World War in 1914.

4. The third phase of development—1914 to 1925.

At the beginning of the transitional stage Japan was a feudal state with a typical fuedal commercial organization. was represented by the exchange shop; industry by the household undertaking, consisting of a master craftsman and his apprentices; communications on land by the courier and handcart; and marine transportation by the junk.

The leaders of the Japanese Restoration were keenly alive to the necessity of developing the country's economic strength in order to place it on a parity with western nations. Governmental missions were sent to foreign countries to study business and industrial methods. A number of enterprises of a modern character were established and operated by the Government. In 1879 the Government instituted the policy of transferring such enterprises to private hands, but made due provision for various kinds of protection and encouragement. Even to this day government and business are closely interrelated and paternalism is the keynote of the Government's attitude and policies.

Baron Hachiroemon Mitsui, Head of the Eleven Mitsui Families whose Centuries-old Code of Business Honor has carried them to the Highest Pinnacle of Commercial Prosperity.

Changes in Status of Merchant Class Significant

One of the most significant results of the growing importance of trade and industry was the complate change in the attitude of the governing class toward the merchants. During the feudal era merchants were at the very foot of the social scale, ranking below artisans and farmers. Political leaders, however, began to court the favor and cooperation of a number of the merchant families that had acquired a certain amount of affluence during the feudal regime. The practice of making marriage alliances between the ruling gentry and the merchant families became the order of the day and many of the prominent merchants were elevated to the peerage. These families are the nucleus around which the existing business organization has been built. This changed attitude of Japanese statesmen gave a great impetus to industry and served to place the capitalistic system on a solid basis.

Growth of Companies Rapid

As a result of the increasing need of capital for developing industries, the sole proprietorships were gradually replaced by companies in which the capital of many individuals was pooled. Since the Russo-Japanese war, in fact, business has been carried on largely under company management.

The following table illustrates the growth of Japanese business organization since the restoration :

Growth of Japanese Business

(In thousands of yen)

Year	Agriculture	Commerce	Industry	Transportation	Total
Authorized Capital					
1869 ...	—	25,434	—	—	25,434
1880 ...	1,053	111,279	14,725	12,080	139,137
1895 ...	2,542	169,251	68,259	57,945	297,997
Paid-up Capital					
1895 ...	2,014	110,585	51,674	67,603	231,966
1903 ...	3,197	451,680	170,346	262,383	887,606
1907 ...	12,035	569,486	381,815	150,891	1,114,227
1913 ...	27,651	931,215	814,804	210,061	1,983,332
1919 ...	76,865	2,460,545	2,721,651	716,435	5,975,497
1923 ...	144,176	4,484,501	4,063,448	919,210	10,211,325

NOTE.—Fisheries and other marine products are included under agriculture, mining under industry, and banking under commerce.

It is evident that growth was fairly steady until 1914, although the termination of both the Sino-Japanese and Russo-Japanese War witnessed a sudden jump in number and capitalization of companies. The great increase occurred in the period from 1913 to 1923. This was a result of the favorable position of Japan during the World War and the boom period which followed immediately thereafter.

Companies Classified Under Commercial Code

The commercial code was enacted in 1890. It created four kinds of commercial companies : Ordinary partnerships (gomei kaisha), in which each of the partners is unlimitedly liable for the debts of the firm ; limited partnerships (goshi kaisha), in which there are both active partners with unlimited liability and partners with limited liability ; joint-stock companies (kabushiki kaisha), similar in character to the English joint-stock companies ; and joint-stock limited companies (kabushiki gashi kaisha), which are limited partnerships in which the capital contributed by the limited partners is represented by transferable shares. Each of these four classes of companies is a juridical person like a corportation in the United States. At the end of 1923 there were registered in Japan :

Paid up Capital

		Yen
4,865	ordinary partnerships	649,900,000
9,662	limited partnerships	704,625,000
17,516	joint-stock companies	8,851,952,000
47	joint-stock limited companies ...	4,848,000
32,090	Total	10,211,325,000

Many companies have been organized by foreigners under Japanese law, thereby securing practically all of the rights of similar companies organized by Japanese. Foreign commercial companies not organized under Japanese law are recognized and are allowed

Baron Kihachiro Okura, head of the great commercial house which bears his name. An ardent advocate of Sino-Japanese co-operation who at the advanced age of 88 declares his intention to devote his remaining years to the promotion of closer relations between the two countries

The Kuhara Head Office Building

to do business in Japan. A foreign company may even have its head office in Japan, but in that case it must comply with the requirements which the law imposes on Japanese companies. The representative of a foreign company which establishes a branch office in Japan is deemed to have full power to act for his company.

Business Centralized in Tokyo-Yokohama and Osaka-Kobe District

The financial control of companies organized in Japan is highly concentrated in the two main districts of Tokyo-Yokohama and Osaka-Kobe. Of the total capitalization of 10,211,325,608 yen shown in the foregoing table, 3,629,439,970 yen, or approximately one-third, represented companies whose head offices are in Tokyo; 2,830,241,185 yen, or more than one-fourth, those established in Osaka; 889,800,309 yen, the Kobe district; and 359,824,195 yen, Yokohama and the surrounding district. The combined capital of companies in these four cities aggregated 7,706,305,668 yen, or approximately 75 per cent. of the total business capital in Japan. Furthermore, 95 per cent. of the companies registering as specializing in foreign trade were located in these cities. The actual distribution was as follows:

Distribution of Companies Specializing in Foreign Trade

Location	Number	Paid-up capital *Yen*
Tokyo ...	93	91,243,500
Yokohama	87	29,182,100
Total ...	180	120,425,600
Kobe ...	151	95,290,850
Osaka ...	120	94,001,416
Total ...	271	189,292,266
All other cities	59	14,331,000
Grand total	510	324,048,866

This concentration is an important consideration in arranging for representation in Japan. It means that, in most instances, it is necessary to consider only these two districts, the only exceptions occurring in the case of exportation from Japan of a few commodities whose production is localized in smaller trade centers such as Nagoya, Shizuoka, Otaru, and Nagasaki.

Family Groups Dominant in all Phases of Business

The family group, which took such a prominent part in the early development of Japan, is still a dominant factor in Japanese economic life. Its business may be described as a gigantic vertical trust, covering nearly every field of economic activity. Generally, control of the enterprises of such a family group is vested in a holding company which owns a controlling interest in other company organized for a specific purpose. The direction of the activities of one of the largest of these groups, for example, is centered in an ordinary partnership capitalized at 200,000,000 yen. This company controls 21 other organizations with an aggregate paid-up capital of 475,-245,000 yen. Their actitivites include banking, real estate, trust business, warehousing, mining, manufacturing, and transportation. The aggregate paid-up capital of 675,000,000 yen compares favorably with some of the largest corporations in the United States.

There are about 15 of these great family organizations in Japan, of which the Mitsui, Iwasaki, Sumitomo, Yasuda, Matsukata, Okura, Suzuki, Asano, and Kunara interests are the most important. The nine families listed control and operate 144 companies with an aggregate paid-up capital of about 2,360,000,000 yen. In addition, they are interested in a number of other undertakings that are not listed in available returns; in fact, it has been estimated that the family groups control not less than 30 per cent. of the total business capital in Japan.

Trading Companies Included in Family Groups

A trading organization is included among the companies under the control of each of the family financial groups. The primary purpose of such a company is to act as purchasing and sales agent for all of the industrial and other concerns in its own financial group. This does not mean, however, that it will serve satisfactorily as a medium for reaching only firms within its own group, as the trading companies do considerable business on a reciprocal basis,

The Nihonbashi Branch of the Mitsui Bank

especially in the case of manufactured commodities for which they are exclusive agents.

Elaborate Organizations Maintained by these Companies

The trading companies controlled by these financial groups have built up elaborate organizations with branches in the principal commercial centers of the world and in the important distributing districts of Japan. In the case of Japanese staple export products, such as straw braids, toys, mattings, and embroideries, they often supply the raw materials and finance the manufacturer during the process of production, and assemble, grade, and pack the products of a large number of households. This procedure is necessary because the small manufacturer in Japan has no knowledge of foreign languages nor of foreign markets and trade methods, and is unable to produce in large enough quantities to make separate shipments profitable. Furthermore, he has slight financial or credit resources and has no organization to handle the intricate details of foreign trade. A similar situation exists in the import market. Consumers of imported goods usually find it unprofitable to engage a staff familiar with foreign languages and to undertake all the details of import business for the sake of an occasional order. In short, the trading companies with their superior facilities and experience can import and export more economically, even after charging a commission.

Trading Company Dominant in Foreign Trade

The trading companies controlled by the more important family organizations have acquired a dominating position in the foreign trade of Japan, so that it is difficult for smaller organizations to compete with them; consequently, the profitable business of the latter is confined largely to articles the market for which is too limited or too specialized to interest the larger companies. It is apparent, therefore, that individual manufacturing agents without a complete organization for the importation and distribution of foreign goods in the case of imports and for assembling, grading, financing, and packing in the case of exports are usually of little general service to the firms they represent. This remark, however, does not apply to the more important American and other foreign trading firms established in Japan, since most of these maintain organizations similar in scope to the larger Japanese financial groups. They also enjoy special adventages in certain lines and are fully qualified to represent American manufacturers. For certain specialized lines furthermore, the individual manufacturer's agent is entirely satisfactory.

General Trading Firm Most Desirable Representative

It is apparent from the foregoing description of Japanese business, that the conduct of foreign trade is thoroughly organized and concentrated in the hands of a comparatively few powerful and highly specialized firms. Attempts to establish direct trade between the producer abroad and the consumer in Japan, or vice versa, have generally failed, owing primarily to the language barrier, the small scale of production and consumption in Japan, and the vast difference in business customs. Experience has shown the importance of selecting as a representative for Japan one of the larger general trading firms (Japanese or foreign), except in the case of a few classes of goods, such as, for example, professional and scientific instruments, for the marketing of which certain smaller firms have special facilities, and in the case of foreign exporters whose market in Japan is sufficiently large to warrant the establishment there of their own sales organization.

International Exhibition for Inland Navigation and the Utilisation of Hydraulic Power, Basle, 1926

THE International Exhibition for Inland Navigation and the Utilisation of Hydraulic Power, which will be opened on July 1, 1926, in Basle, on the occasion of the placing in commission of the completed extensions to the new Rhine Port at Kleinhüningen, will be organised as an international manifestation of paramount importance. The town of Basle, lying as it does at the important point where the swift flowing river, so suitable for the production of hydraulic power, is transformed into a more navigable waterway, thus assumes the character of a Rhine port and is the present terminus of the intensive traffic on the Rhine. Inland navigation and the utilisation of hydraulic power, both being important factors in the economic life of the town, are to be extensively represented in the International Exhibition. The exhibition has an official character and is honored with the patronage of the President of the Swiss Confederation. Applications have already been received from 16 different countries, viz. :—Belgium, Germany, France, Great Britain, Holland, Italy, Canada, Norway, Austria, Poland, Sweden, Switzerland, Spain, Czecho-Slovakia, Hungary and the United States of America. In addition the governments of 11 countries, viz. —Belgium, Germany, France, Holland, Italy, Austria, Poland, Switzerland, Spain, Czecho-Slovakia, Hungary and various departments of the United States Government, all of which will be represented by special exhibiting groups, have definitely promised to participate. Negotiations are still in progress with a number of other countries. The participation of the League of Nations may be taken as a convincing token of the valuable opportunity the international world sees in the important Basle exhibition as a means of promoting international collaboration in technical matters. The League of Nations will be represented by its Transport and Transit Commission and the International Labor Office.

Great Britain is represented at the International Exhibition by an attractive stand of the "British and Allied Manufacturers' Association," the Canadian Government intends to organise a typical Canadian display through the intermediary of the Canadian High Commissioner in London. This display will arouse much interest, Canada being quite popular in Switzerland as new home for so many Swiss settlers. The United States are represented by the "Federal Power Commission," the U.S. Geological Survey and the Smithsonian Institution, all of Washington D.C. The interest thus shown by Great Britain, Canada and the United States to the Great Swiss International Exhibition in Basle will help to promote friendship between these countries and the Swiss people and foster the mutually profitable exchange of goods.

The 38 technical groups will portray, on an all-embracing and most comprehensive basis, all the principal aims and objects of inland navigation and the utilisation of hydraulic power and by means of original exhibits, models and pictorially, will present a visible record of the technical achievements of the various nations. The international importance of the exhibition will be increased by the fact that, during the course of its run from the July 1 to the September 15 a number of important congresses, meetings, and conferences will be held in Basle which will become the rallying point of delegates from all the countries of the world. Amongst the 35 to 40 meetings already provided for, stands the First Sectional Meeting of the World Power Conference (August 31 to September 12) which will be attended by the delegates of 30 countries. These delegates will be prominent personalities in the world of industry finance, technical achievements and science. There is a probability that the European "Educational Film Conference" will be held in Basle during the Exhibition. In addition the management of the exhibition will organise a large number of technical excursions to typical Swiss hydraulic power installations and places connected with inland navigation and other large industrial undertakings. Tourist offices in the various countries have expressed their willingness to organise collective tours and special trains. A special official travel bureau will be opened by the exhibition authorities for the purpose of affording visitors an opportunity of making long and short automobile trips at special rates with a view to becoming acquainted with the natural beauty spots of Switzerland.

Fighting Humidity and Heat in China

By C. A. Middleton Smith, M.Sc., M.I.M.E, Taikoo Professor of Engineering, in the University of Hongkong

THE Greek words from which the words "atmosphere" is derived mean "vapour" and "sphere." That reminds us that the atmosphere contains vapour. In the tropics, the air is almost saturated with water vapour. Can we squeeze it out ?

During the last half century mankind has obtained so many priceless gifts from inventors, that new inventions are now accepted almost as a matter of course. It is seldom realised that the completed invention has often cost years of concentrated study and research before it is a commercial success.

Great discoveries or inventions are seldom the work of one individual. Let us take, as a fairly typical example, the case of wireless broadcasting. A professor at Cambridge, Clarke Maxwell, proved on paper that there must be waves which, some years later, were located by Hertz and are now called Hertzian waves. It was, however, quite a long time before the waves were used for transmission purposes. A Frenchman, Branly, forged one important link in the chair of inventions, and Lodge, an Englishman, forged another link. Then Lodge succeeded in a practical demonstration of wireless messages in the quadrangle at University College, Liverpool. These four men, Clarke Maxwell, Hertz, Branly and Lodge supplied the scientific genius. Then came Marconi with what might be called the genius of the applied scientist, or the commercial engineer. Others were able to add links to the chain of inventions that made possible the wireless transmission of the human voice. To-day we receive in Hongkong words which are spoken by a voice in Rugby, England. The foundation stone of that wonderful edifice which the general public know as "broadcasting" was the work done, with paper, pen and mathematical symbols in the University of Cambridge by Clarke-Maxwell.

The Problem of Cold

We are nowadays so used to seeing blocks of ice and to talk about cold storage that it is difficult to realise how recently man has discovered how to produce cold. The first great invention of the human race was the production of heat. When our primitive ancestors discovered that, if two dry sticks are rubbed quickly together, a fire can be kindled, the first red glow of the dawn of civilisation appeared on this earth. Until recent years, it was believed, at any rate in Christian countries and by the Jews, that the history of mankind stretched back about 6,000 years. Now we know that the Bible story does not agree, in time measurement, with the indisputable evidence of science. We may accept the general idea that man discovered how to kindle a fire much earlier than sixty centuries ago—possibly it was six hundred centuries ago.

It is however only during the last half a century that man has been using heat pumps and so producing cold. The curious part of the whole business is that the mechanical production of cold is done in such a roundabout process. First of all, heat is produced by, let us say, the combustion of coal. Then steam is formed by allowing the heat from combustion to pass to water in a boiler. Next, steam is carried to an engine. We use the steam as a heat-carrier-any other efficient heat-carrier would do if we could find one.

In the engine we convert the heat in the steam into mechanical work and we use that mechanical work to produce cold. All the manufacture of ice and the cold storage arrangements depend upon the mechanical production of cold.

The Heat Pump Idea

Now what do we really mean when we talk about the mechanical production of cold ? In the first place, we suggest a reduction of the temperature of a body below the general level of the temperature of the surroundings. We also imply that the body is kept at a lower temperature than the surroundings. In other words, we mean the continuous extraction of heat from a body whose temperature is already below the temperature of the bodies in its neighbourhood.

Let us take a practical example. A cold storage room is being maintained at 18° F. while the air surrounding the room is at 80° F. We must go on continuously pumping out the heat which comes into the room from leakage outside, and also the heat that is in any articles (such as food) which may be carried into the room for storage purposes.

Thus, if we wish to maintain a low temperature in a cold storage room, we must continuously extract heat from it. But the room itself is always colder than its surroundings. So that we must, as it were, cause heat to be pumped out of something cold and let it be discharged into something relatively hot. It is like causing water to go uphill. We can only do it with the use of a pump.

That is just what happens when we make ice. We place a can containing pure water in a bath of brine. The brine is maintained at a temperature which is less than that at which water freezes. Therefore heat is, as it were, sucked out of the pure water (which in consequence becomes ice) and passes to the brine. We have also to arrange that the heat shall be sucked out of the brine as quickly as it flows into the brine from the water that is being made into ice.

What becomes of the heat that is so abstracted out of the brine ? It is not destroyed. It is raised to a higher level of temperature and then discharged by being given up to some substance which acts as a receiver of heat. It is a simple idea, this notion of a heat pump. We take heat out of the pure water and we have to get rid of it somehow or other.

The Effect of Moisture

That was the idea that set engineers thinking about the mechanical production of cold. This is how they solved the problem. They extracted heat from a heat carrier by means of cooling water and they used the heat carrier to abstract heat from a room.

They made experiments with air as a heat-carrier and they quickly saw the disadvantages of air as compared with ammonia or carbon dioxide for heat carrying purposes. First of all, air may contain a great deal of moisture, especially in the tropics. Let us take a practical example. During the summer, in Hongkong, the air is often at a temperature of 90° F. It is also so humid, or moist, that it is practically saturated with water vapour.

At 90° F. the volume of 1 lb. of *dry* air (i.e. air free from humidity or moisture) is 13.86 cubic feet. Saturated with moisture, or water vapour, the volume of 1 lb. of air and the water vapour is 14.55 cubic feet.

The amount of heat in 1 lb. of *dry* air at 90° F. is 21-74 British Thermal Units. The amount of heat in 1 lb. of dry air and the water vapour that saturates it is 54.13 B.Th.U. That is to say more than double the amount of heat is contained in one pound of the atmosphere if it is saturated with water vapour than if it is dry.

The temperature still remains at 90° F. in both cases of dry and saturated air. But 32.39 B.Th.U's per lb. of air must be pumped out of the wet air to make it dry.

In actual fact the air never is completely dry. There is always present some water vapour. You can easily experience, however, the great difference in the humidity of the atmosphere if you live in Hongkong during the summer (where the air often is practically saturated) and then go to Manchuria or other places where the air is dried because it comes across a desert which absorbs some of the moisture.

In cooling the air to very low temperatures the moisture is deposited as snow.

Eliminating Moisture

Now let us consider air at 64° F. The heat content of one pound of dry air is 15.45 British Thermal Units (B.Th.U's) and of air saturated with water vapour is 28.93 B.Th.U.

If therefore we wish to reduce one pound of saturated air from 90° F. to 64° F. (saturated) we must reduce the heat content from 54.13 B.Th.U. to 28.93 B.Th.U. In other words, we must remove 25.2 B.Th.U. per lb. of air.

Let us also consider how much water vapour has been condensed in the process. At 90° F. the weight of water vapour per pound of dry air is 0.0319 pounds. That is to say, for every 100 lbs. weight of dry air we have 3.19 lbs. of water vapour in addition when the air is saturated. At 64° F. the weight of water vapour (for saturation purposes) per pound of dry air is .01276 lbs. So that we have condensed .01914 lbs. (i.e. 0.0319-.01276 lbs.) of water from every pound of saturated air that we reduce from 90° F. to saturated air at 64° F. If we wished to have the air at 64° F. at a relative humidity of 50 per cent. we should have to remove another .00638 lbs. pf. water vapour from each pound of air.

It is the efficient removal of this water vapour which is the problem that must be solved before we can obtain any improvement in the climatic conditions of Hongkong or other tropical places during certain periods of the year.

It is, of course, hopeless to attempt to remove entirely the water vapour from the atmosphere that envelopes the Colony. The moisture laden air would quickly rush in and nullify such efforts. We must deal with much smaller volumes of air such as are contained in living rooms.

Is it, however feasible to do anything for a room? Let us take the case of an operating theatre in a hospital. There is no doubt that a surgeon who has to work with all the necessary equipment in such a theatre in Hongkong has a most exhausting task. Those who have done this work say that in the summer they are quickly in a bath of perspiration.

During some days, in the winter, in Hongkong the atmospheric conditions are not more uncomfortable for such work than in England. In the summer, the humidity effects human efficiency.

Artificial Atmospheres

How can we reproduce, during the summer, the atmospheric conditions of the winter in the local operating theatre?

The most obvious thing to do is to place huge blocks of ice in the room. On reflection, many objections can be realised. The ice melts and if the air in the room is not saturated on entry it will soon lick up moisture from the melted ice. Ice is expensive and it is clumsy. It is not really a solution of the problem.

Why not make the theatre like a cold storage chamber? It would seem to be simple to arrange brine pipes all around the room. Thick insulating material (cork or asbestos) would keep the room cold, or, in other words, prevent heat from leaking in rapidly if we had a heat-pump, (or refrigerating plant) to extract the heat from the room. One difficulty is the problem of light. It is obviously much better to have natural rather than artificial light for such a place.

Condensation Troubles

There is, also, the vapour. If we cool the room, we do not eliminate the vapour. Indeed, we increase the unpleasantness due to humidity if we cool the room by putting brine pipes around the interior of it. The brine-pipes would quickly become covered with snow due to the deposit of moisture with the fall of temperature, but the atmosphere would remain saturated at the temperature to which it was cooled. We must always remember that it is the excessive humidity and not the temperature that is the real trouble.

Let us take a practical case. The amount of moisture in a cubic foot of air that is saturated at 64° F. is roughly about the same weight as weight of water vapour that is present in one cubic foot of air that has a humidity figure of about 50 per cent., but is at 84° F. temperature.

Now comes the curious fact. It is stated by the doctors, and other people who study the subject agree with the doctors, that air at 64° F. *when it is saturated* is much more unpleasant for humans than is air at 84° F. which is only half-way towards the saturation figure; or, in other words, saturated air is more unpleasant than fairly dry air, even although the dry air is at a much higher temperature.

So that if we had air in the room at 84° F. that was nearly saturated, the effect of cooling the air *without drying it*, would be simply to saturate it and we should probably also deposit a great deal of moisture on the walls and furniture of the room. The atmosphere (saturated) at 64° F. would be made more unpleasant by our efforts.

We therefore see that it is not so much a problem of lowering the temperature of the air in the room as of getting rid of the humidity or water vapour in the atmosphere.

Looking at the problem from rather a different point of view, we may find ourselves surprised to realize this curious fact. If we have air, saturated with water vapour at 64° F., we find the atmosphere unpleasant. If we add heat to the air, with no addition of water vapour, and raise the temperature to 84° F., then the air is much more pleasant.

It is strange how our instincts about these things often lead us to do the right thing in spite of a sublime ignorance about scientific facts. We find, in actual fact, that people who live on the Peak in Hongkong often have fires in their rooms even when the air temperature (without a fire) is above 80° F. They say that they wish to dry the room. They do dry the room by raising the temperature of the air. The moisture that was deposited on walls and furniture, because these articles were at a slightly lower temperature than the warm air entering the room, is evaporated as soon as the air temperature of the room is raised sufficiently. That is why, in Hongkong, many of the houses have "hot rooms" for drying clothes in the humid weather.

The Ideal Conditions

The air in the hot room is dried by heating it. In our engineering work, we seldom, if ever, reach the ideals that we set up. If, however, we failed to set up ideals we should have no proper standard of perfection at which to aim.

Carnot, whose centenary we have been celebrating recently, set up the ideal for heat engines. He pointed out to engineers that if they wanted to obtain a maximum amount of work out of a given quantity of heat they must work along certain definite lines. First of all (he said) have as great a range of temperature between the gas (or air) used as a heat carrier when it is admitted to, and exhausted from, the engine. He also proved on paper that it was much better to have a low initial temperature than a high initial temperature, for the same range.

Take the case of a steam engine. Carnot said make the steam as high a temperature as possible before you admit it to the engine and exhaust it at as low a temperature as possible, so as to obtain as big a range of temperature as is possible.

Engineers have followed the advice of Carnot for a hundred years and have always had the ideal conditions outlined by him before them. The result has been that the temperature range has been going up and up, and the fuel consumed has been going down and down!

The initial temperature of steam in a modern steam plant is somewhere about 600° F. The initial temperature of the mixture of air and petrol vapour in a motor-car engine, immediately after combustion, is very much higher, say over 3,000° F. It is owing to the fact that the internal combusition engine more nearly approaches Carot's ideal conditions than does the steam plant that it converts more of the heat given out by the fuel used into mechanical work.

And that is why the internal combustion engine is making such great strides for commercial purposes. It converts more heat into useful work. In other words, we get more work out of a pound of fuel.

Of course, there are other considerations which favour the steam turbine. Carnot, however, did set up the ideal standard for the conversion of heat into mechanical energy. As often happens, the value of Carnot's ideal is being appreciated more and more as itme elapses since he set up the ideal.

What, then, are the ideal conditions which we must set up for ourselves with regard to this problem of the atmosphere in the tropics? Clearly that is a problem that the doctors can decide much better than the engineers.

There is one great advantage that comes to anyone whose life work is in a University. Of course, there are many disadvantages, especially when the University is a pioneer institution, for mental loneliness does not stimulate ideas about technical developments. Technical discussions do. Let us, however, acknowledge the advantages of life in a University. One of the greatest privileges is the exchange of ideas and conversations with colleagues in a

different profession. When we are wearied with studies of Carnot's theories, or when we are tired of explaining why an ice-machine makes ice, we can always turn to a doctor or a political economist or a lecturer on history, for a talk about their work. We can ask them what may appear to them to be childish questions and we know that they will deal with us patiently. No doubt, they remember that in the past, they have asked us questions about motor-cars or the mechanical production of cold, which they suspected at the time, seemed to us to be childish. So we grow to be tolerant, one to the other, in a University. We try to encourage the students to ask us questions, and we are not surprised, after the experience of a few years, at any display of ignorance. Even a Chancellor of the Exchequer in England, Lord Randolph Churchill, one day confessed that figures bothered him. "Those damned noughts are such a nuisance" he explained.

It is perhaps, after all not very wonderful than an engineer should be interested in medical matters for the human body is a wonderful machine.

The Doctor's Verdict

It was, therefore, only in the usual nature of things that an engineer in a University interested in conditions of the atmosphere, and seeking to improve his own efficiency during the summer months, should turn to his medical colleagues for information.

The result of the enquiries were rather disappointing. As far as they went, they disclosed a few facts of general interest; but on the whole, they gave one the impression that the doctors had been so busy fighting the malignant diseases which flourish in the tropics that they had not given a great deal of attention to the problems of humidity.

One medical friend was good enough to say, in reply to enquiries about the effect of humidity upon the human system, that the question "has interested physiologists for the last forty years, but unfortunately, their work has led to very little accurate information."

There are, apparently, six factors which may affect, adversely, the health of Europeans in the tropics. They are:—

(1) High atmospheric humidity.
(2) Excessive dryness of the air.
(3) Great heat
(4) Strong sunlight.
(5) Electrical Instability.
(6) Continued equable temperature.

It seems to be generally agreed that the greatest effect on health is produced by the first mentioned viz:—"High Atmospheric Humidity."

A well-known consultant physician has stated quite definitely that "a temperature of 84° F. with a humidity of 50 per cent. saturation is undoubtedly less depression than a temperature of 64° F. at saturation point."

Why is this? Apparently the regulation of the temperature of the body is maintained by the evaporation of water from the skin and the lungs. When there is complete saturation of the atmosphere there is practically no evaporation from the skin and, in the limit, heart failure occurs.

It may be worth mentioning that the effect of a saturated atmosphere at low temperatures is also most unpleasant. Air at 30° F. contains, per 1,000 cubic feet, when saturated, about $\frac{1}{4}$ lb. of water vapour while 1,000 cubic feet of saturated air at 84° F. contains about $1\frac{3}{4}$ lbs. of water vapour.

Yet the curious thing is that it is the nearness to the saturation point, not the weight of water vapour present that determines our comfort. For saturated air at 30° F. seems to be much colder than dry air at a much lower temperature. It appears to be much more harmful to health.

It must be remembered that people in a room give off water-vapour; according to Dr. Glazebrook, F. R. S. the average human being in repose give off 63 grammes (or 977 grains) per hour. Now at 64° F. one cubic foot of air contains 6.643 grains of water vapour, so that one person breathing for one hour gives off enough water vapour to saturate 147 cubic feet of absolutely dry air. Stating the problem in rather a different manner one might say that if the air at 64° F. were at about the right degree of humidity (say 67 per cent.) then one person breathing for one hour would saturate 441 cubic feet of air.

That statement shows how essential it is to remove frequently the air from a cinema theatre where are assembled some hundreds of people.

The Ideal Atmosphere

What then, is the ideal atmosphere that we require for maximum human efficiency?

As far as the medical books and experts can tell us it is anything with a humidity at about 70 per cent. and a temperature that varies from about 65° F. to 75° F. Of course, it must be pure air, not dirty smoke-laden air, that we breathe.

We have therefore narrowed down the problem of creating an artificial atmosphere in our houses in the tropics to this. We must change air at, say, 90° F. temperature and what, for all practical purposes, we may call saturated air to air at say 70° F. and 70 per cent. humidity.

The most obvious method of doing that is to seal up a room, extract the hot and humid air from it and simultaneously return to the room air that will be at, say, 70° F. and 70 per cent. humidity.

When once we have reached a state in which the air is at the ideal conditions we shall have to continue with the work of removing and replacing the air because both heat and humidity will leak in. Also moisture is being given off by the people in the room.

The following rather crude experiments were made by the writer in the hope of gaining same data.

An air compressor was employed to take in hot and saturated air, and the air, at 80 lbs. pressure above atmosphere, was forced into a tank. The tank was so large that for all practical purposes, it radiated heat as quickly as the hot air came in. So that the air coming out of the tank was at 80 lbs. pressure above atmosphere but at atmospheric temperature. Condensation of water vapour took place in the tank.

The Compressor dealt with about 100 cubic feet of air in a minute. The same amount of air per minute was delivered from the tank to a small steam engine where it was used for doing useful work. The Compressor consumed about 20 kilowatts of electrical energy and the steam engine gave out about 4 horse-power. Let us say that the nett result was that at the expenditure of about 17 electrical units per hour we were able to compress 100 cubic feet of air per minute or 6,000 cubic feet per hour.

Not only did we compress that air and expand it, we took it in at 90° F., when 1,000 cubic feet contained (at saturation point) more than 2 lbs. pounds of water vapour. We delivered it back to the room at 30° F., when 1,000 cubic feet of (saturated) air contained about $\frac{1}{4}$ lb. of water vapour. In other words, in ten minutes we extracted rather more than $1\frac{3}{4}$ lbs. of water vapour per 1,000 cubic feet of air. Since we dealt with 6,000 cubic feet of air in an hour we extracted from the room about 11 pounds of water in an hour.

It must be emphasised that we did not actually measure the amount of water extracted and no doubt, as we continue the experiments we shall find that we extract, in actual practice, rather less than is calculated because the air in the room is gradually becoming less humid.

Let us, however, continue our calculations. Let us take a fairly big room, say 30-ft. by 30-ft. by 20-ft., containing therefore 18,000 cubic feet of air." If we run the machine continuously for three hours we might, under the best possible conditions, calculate to remove about 33 pounds of water vapour from the room. In actual fact, of course, as the room becomes less humid there is less water in each 100 cubic feet drawn into the compressor.

It must be remembered that while we are removing the water vapour we are also reducing the temperature of the room. It is probable that heat will leak into the room much faster than moisture. In other words, we shall probably not lower the temperature of a non-insulated room very much. As has already been explained, we are not very much concerned about lowering the temperature, although it is obvious that if we continue to draw out from a room 100 cubic feet of air at 90° F. and simultaneously deliver the same quantity of air at 30° F., we shall inevitably lower the temperature of the room.

As we lower the temperature of the room, however, we make the air more humid and it is possible that we may even wish to heat the air before it is sent back to the room so as to keep the humidity at the ideal of 70 per cent.

If the air delivered into the room at 30°F. is (as we assume to be the case) saturated, we find that, each 1,000 cubic feet of such air

contains about ¼ lb. of water vapour. But the amount of water vapour required to saturate 1,000 cubic feet of air at 90°F. is more than 2 lbs.

Now it is reasonable to suppose that, with a properly designed but non-insulated room (insulating a room is too costly and inconvenient to be practicable) the temperature of the air would never be reduced, in the room itself, to anything like 30°F. It will be much nearer the 90°F. temperature.

We may, however, safely assume that in a properly designed room very little water-vapour would leak in from outside. In actual fact, it is no uncommon practice for householders on the Peak (Hongkong) to close all of their windows so as to keep out the fog, or saturated atmosphere. The rooms on those houses are not designed to keep out fog; on the contrary, they usually have big and badly fitting windows.

However, to return to our problem of the air delivered at 30°F. If the water-vapour were squeezed out of the air at 90°F. to have it saturated at 30°F. and the air were heated from 30°F. to 90°F., then the dry air at 90°F. would be ever so much too dry; it would, indeed be at a humidity of 13 per cent. which would be nbearable. Even if the heat did not leak quickly in and the air in the room were at say 64°F. the humidity would be 38 per cent.—a very uncomfortable condition.

Let us suppose that we managed affairs so as to finally get the room at 64°F. with the desirable humidity of 70 per cent. Every 1,000 cubic feet of air in the room at 64°F. would then contain nearly 11 oz. of vapour.

Since 1,000 cu. ft. of saturated air at 90°F. contained rather more than 2¼ lbs. of water vapour, what we really want to do is to squeeze out of each 1,000 cubic feet of air about 1½ lbs. of water vapour or out of 6,000 cubic feet of air about 9 lbs. of water vapour.

So that really our problem comes down to this. We have a large room at 90°F. with 18,000 cubic feet air saturated. We want to get rid of 27 lbs. of water out of the atmosphere and we would like to reduce the temperature to about 70°F.

Heat Extraction

Now let us consider the problem of drying the air by various methods. We may assume that the following ways can be considered.

(1). The use of an air-compressor.
(2). The use of refrigerating plant.
(3). The use of chemicals.
(4). Electrical deposition of moisture.

(1). We have the figures given above concerning the use of the air compressor. The cost of running a 17 Kilowatt machine is considerable. At, say, 5 cents an electrical unit, it is 85 cents an hour. There is also the initial cost of the equipment needed, cost of buildings, maintenance and repairs.

Possibly the size of the machine could be reduced considerably if it were kept running more continuously, but one hesitates to give an opinion without much more data.

On the other hand, it might be possible especially to design an equipment that would be small and cost only about 5 cents an hour to run, but would require to be working for say 16 hours out of the 24.

There would be many people who would willingly pay a sum such as $250 initial cost and even $3 a day during the periods of great humidity if they could reduce the saturated atmosphere of 90°F. to an atmosphere of 70 per cent. humidity and 70°F.

Experiments are being made with that object in view, but there is nothing to cause the reader to be very optimistic. The whole problem, in common with nearly all engineering problems, comes down to a matter of costs. People will use mechanical or electrical appliances to increase their comfort only if they can afford to do so.

(2). Let us consider the problem of extracting the moisture from the atmosphere by means of a refrigeration plant.

In the University of Hongkong, we have a small ammonia plant. Electrical Power is supplied to an electric motor, which in turn drives a line of shafting. The shafting drives the ammonia compressor and the brine pump.

There are, relatively high frictional and other losses in such a plant because it is small.

Some actual figures of such a plant tested by the writer may be of interest. On one test 168½ lbs. of ice were made from tap water. The total heat extracted from the water to form ice was (in round figures) 24,000 B.Th.U's.

The brine pump and the ammonia compressor absorbed just 2.002 horse-power, but the electrical energy supplied to the motor (and it is that electrical energy that must be paid for) was 4 units an hour. Since it took rather more than eight hours to run the test, we may take 32 units as the total electrical consumption. At 5 cents cost per unit, that is $1.60.

Let us assume, then, for rough calculations that by the use of a freezing plant costing about $2,000 initial outlay, occupying a floor area of about and costing 20 cents an hour for electrical power, we can extract 24,000 B.Th.U's from the air.

Let us now take the problem as follows. We have a room containing 18,000 cubic feet of saturated air at 90°F. We wish to reduce that 18,000 feet of air to 70°F. and 70 per cent. humidity. Assuming no leakage of temperature or humidity into the room what will it cost if we use cold brine for the purpose?

At 90°F. the heat content of 1 lb. of saturated air is 32.29 B.Th.U. The volume occupied by 1 lb. of saturated air at 90°F. is 14.55 cubic feet. Hence 18,000 cubic feet of saturated air weighs, say 1,237 lbs.

Now the heat content of 1 lb. of dry air at 70°F. is 16.9 B.Th.Us. If we have this air at 70 per cent. humidity the heat content is 28.5 B.Th.U.

The removal of 3.79 B.Th.U's per lb. of air is needed, or for 1,237 lbs. of air, say 4,700 B.Th.Us.

If the ice plant mentioned above removed 24,000 B.Th.Us. in 8 hours, we could have a plant about 1/5 the size to remove 4,700 B.Th.U's in 8 hours. The cost for electrical power, if pro rata, would be cents 32.

There is, however, one fact which must not be overlooked. The air must be taken out of the room, or *moved*, so that condensation shall not take place in the room itself. That is to say, we must have a fan (with its cost) in order to move the air out of the room and get it back again.

Also it must be remembered that the condensation on the brine pipes is in the form of snow which must, if there is much of it, be removed. That could be arranged by using two sets of brine pipes, but simplicity is an ideal to be aimed at with all domestic appliances.

A New Invention

The really unsatisfactory thing about the present mechanical methods of producing cold is the great waste of power due to frictional losses.

In the case of a small refrigerating plant, it was calculated by using the formula for the work done in compressing a gas that only about 20 per cent. of the electrical power supplied to the motor was used in compressing the heat-carrier and in stirring the brine. The mechanical losses of the compressor itself are considerable.

So that if the friction losses were entirely eliminated the cost for electrical power would be only about 6 cents for making the room containing 18,000 cubic feet of saturated air at 90°F. contain the same volume of air at the humidity and temperature we desire.

These facts were realised some ten years ago by the writer who immediately set to work with experiments to see whether the frictional losses could be reduced. Finally, he considered in detail the methods used for producing cold by chemical means.

Suffice it is to say that it soon became clear that, with the existing knowledge, very little improvement would result if such chemicals as sulphuric acid or calcium chloride were used.

We have recently been informed that two young engineers have invented a completely new system of refrigeration. All of the available information makes us sanguine that this new invention will entirely change all of our methods of producing cold. It cuts out all moving machinery and therefore it eliminates all mechanical losses.

Full descriptions of the new plant will no doubt appear in time. From those now obtainable is appears that ammonia and hydrogen are employed as heat carriers. Heat is applied by means of a gas flame, or an electric heater, and a supply of cooling water is needed. There is no friction because there are no moving parts.

If this apparatus is all that it seems to be, we should be able to produce cold, at any rate on the comparatively small scale needed for the purposes we are considering, at a very low figure.

We do not yet know the initial cost of the apparatus but the elimination of all moving machinery is a remarkable achievement.

We are, therefore, sanguine that the new invention will become a household fitting as common as the kitchen boiler and that we shall use it, not only for keeping the ice-box cold, but for extracting the water from the hot, humid air of the tropics.

A Costly Scheme

The Use of Chemicals seems out of the question but some figures may be of interest. An expert chemist has very kindly supplied the following information which speaks for itself.

The most suitable chemical for the purpose would be concentrated sulphuric acid, (H_2SO_4) but it appears as if the cost of that would be prohibitive. The difficulty of dealing with it would also make it very troublesome in practice.

Air passed through sulphuric acid would certainly be dried quite well. For 100 lbs. of H_2SO_4 SP GR 1.84 would take up 71 lbs. of water and the resulting acid would still be able to absorb 74 per cent. of the moisture in air saturated at 86°F.

100 lbs. of H_2SO_4 SP GR 1.84 would take up 118 lbs. of water and the resulting acid would still be able to absorb 50 per cent. of the moisture in air saturated at 86°F.

The cost of a ton of H_2SO_4 at present is £6-15 at the works. By the time, it reached Hongkong it would cost at least £10 per ton, say $100 per ton, i.e. about $4.46 per 100 lbs. Unless the concentration were carried out on a very large scale, it would be impracticable; on the other hand there might be a local market for H_2SO_4 of 44 per cent. strength.

If, however, 100 lbs. of H_2SO_4 would absorb 118 lbs. of water at a cost of, say ever $5, it would only cost about $1 to absorb the 27 lbs. of water in the room at 90°F. We should not lower the temperature of the room.

In the case of the use of acid, as with the use of refrigerating machinery, the air would have to be moved out of the room. It would be forced through the acid under a small pressure—the air would come out of the surface of the liquid acid as bubbles.

On the whole, it is not very likely that chemical methods would of removing moisture from the air compete successfully with the other methods mentioned above.

Electrical Methods

Many years ago, the writer saw Sir Oliver Lodge deposit a mist or fog in a small glass jar. He used an electrical discharge for the purpose.

As far as can be ascertained that idea has not yet been applied to any apparatus for drying the atmosphere.

In America there have appeared reports of experiments made with aeroplanes, but it is difficult to obtain any definite data and it is not easy to remember any details.

The writer has a vague memory of reading about the discharge of sand charged with electricity from an æroplane; the idea being that the electricity on the tiny particles of sand causes rain to fall.

It has, of course, been suggested that the effect of almost universal broadcasting in the conditions of the atmosphere has yet to be determined.

There is no evidence, as far as can be discovered by a glance through scientific journals, that broadcasting causes moisture in the atmosphere to be deposited.

In Conclusion

It will be realised from all that has been written above that, at present, the problem of drying the air in the living rooms of houses in the tropics has not yet been completely solved.

It may be that certain individuals have succeeded in making the atmospheres of their homes less humid. If so, they might publish the results of their experiments and experience.

When we consider the large sums of money that are spent in heating houses in cold climates it is strange that people in the tropics have not made more effort to ease their troubles due to a humid atmosphere.

It may be that the humidity itself is the cause. It is so deadening in its effect on the human mechanism that it makes the people in the tropics loth to stir themselves. Those who do not live in the tropics are not particularly interested in the matter.

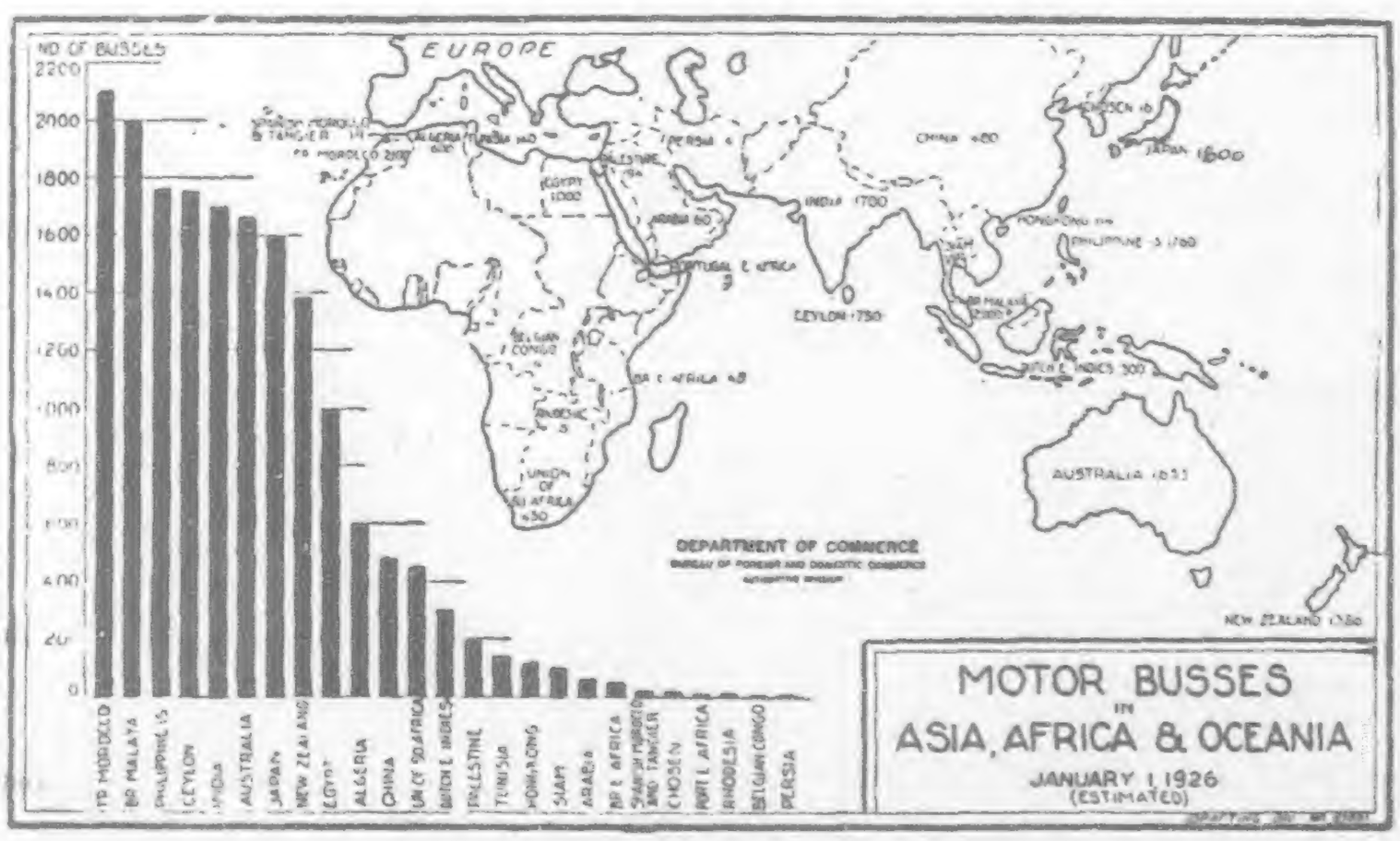
In some parts of the world, the air is so hot and dry that the human machine crates for moisture. It would seem to be much easier to add the desired amount of moisture to the atmosphere than it is to remove the humidity from an atmosphere which is near to saturation point.

The coast line of any country is particularly liable to have a humid atmosphere. The southern parts of China, with its lengthy coast line, is no exception to the rule. It is only necessary to experience the unpleasantness of great humidity in Hongkong, Swatow or other coast ports to long for some cheap method of removing moisture from the air.

Bus Transportation In Asia

British Malaya

Virtually all of the 2,000 busses in British Malaya at the end of 1925 were owned and operated by private individuals. Busses are operated in most towns and on the prinicipal highways, but there is no apparent attempt to maintain regular service to conform to a definite schedule. Standard passenger chassis are generally used, and the bodies are the small, open type, with a seating capacity of eight persons and two parallel seats running from the rear to the front. Bodies are made locally. Probably 80 per cent of the chassis are American make. Distribution is effected through manufacturers' agents. British Malaya maintains excellent streets and roads, the system including a main trunk road from Singapore to Penang, the entire length of the peninsula. There is small likelihood of a demand for more expensive busses than the plain, simple type now used.



French Indo-China

Because of the lack of adequate railway facilities, French Indo-China has a great number of motor-bus lines that transport passengers, post and light freight. No information as to the actual exent of bus service is available, but the aggregate mileage is large. Busses operating on postal contract are subsidized by the Government. French makes of chassis are the most popular, while bodies are made locally. Chassis of from 1 to 11 tons are preferred. Distribution is generally effected through the agents of the manufacturer. Purchases are usually made on the installment plan. The terms of sale are considered satisfactory enough to encourage the development of bus operation, but there is small likelihood of any specific opportunity for the sale of busses in large numbers, as neither enterprise nor present traffic warrants the prospect of sudden expansion of the market in Indo-China.

The Mineral Resources of the Far East*

By C. K. Leith

THE common use of phrases like "the yellow peril," "the awakening of the Far East," "the challenge of Asia," imply a widespread belief in the capacity of the Far East[1] to advance in culture and industry, as well as in political and military power, to a position more or less comparable to that of Western Europe and the United States. It is apparent from the nature of the discussions that this belief is based principally on a consideration of the human factors involved in education, in the growth of population, and in political development. One looks in vain for correspondingly adequate consideration of the physical environment, to see how far it will permit of the expected advances. It seems to be assumed that the necessary physical resources will be found when the eastern peoples come to a point where they can use them. The Far East of the future is pictured with the familiar lineaments of highly industrialized western countries, where the "industrial revolution" has been based to a large degree on the extensive use of coal, iron, and other mineral products. It is pertinent, therefore, to appraise the mineral potentialities in the Far East, in order to see how far they justify the assumption that changes will take place there of the kind we ordinarily associate with modern industrial progress.

At the present time the countries of the Far East yield only an insignificant proportion of the world's total of the essential commercial minerals,—for example, about five per cent. of the copper, one per cent. of the iron ore, five per cent. of the coal, and three per cent. of the oil. Only in a few of the less essential mineral commodities are the proportions larger. In contrast, the countries bordering or tributary to the North Atlantic now furnish the vastly larger part of the world's requirements in essential minerals,—90 per cent. of the coal, 98 per cent. of the iron ore, 65 per cent. of the copper, and 90 per cent. of the oil.

There is a tendency to attribute this situation to the mere lack of exploration in the Far East, and to assume that when this has reached a stage comparable to that of the North Atlantic countries the production of essential minerals will be more or less equalized. But a survey of the facts proves this assumption to have but a slender basis. In fact, the conclusion seems inevitable that (with certain exceptions to be noted) the present small scale of mineral production in the Far East is not a temporary but a permanent condition, being due to the absence of mineral resources in quantity or grade or distribution suitable for effective use. This conclusion has been repeatedly reached by competent investigators.[2] Nevertheless, due principally to travelers' tales, the prevailing popular notion is that the countries of the Far East, especially China, contain fabulously rich mineral wealth.

In the discussion of this problem confusion may arise unless a scale of comparison is indicated. There are in the Far East many units of mineral resources which seem large in an absolute sense, but which on a world scale must be assigned to a subordinate position. Also, the world scale used for comparison should be that of recent years, for the reason that the demand for mineral resources has so multiplied during the last quarter of a century that it can now be satisfied only by a relatively small number of mineral districts of exceptional size. The result is a marked concentration of the mineral industry in a few places. While in the aggregate other districts may contain vast quantities of minerals, they are so small individually, or so scattered, or are of such a low grade, or involve such high mining costs, that they play only a subordinate part in the satisfaction of present world demands. Much remains to be learned about the world's ultimate resources, but exploration has gone far enough to disclose many salient features of the mineral geography of the future, from which can be gleaned some of the essential facts of the mineral resource situation of the Far East.

Iron and Coal Resources.—In the Pacific region of the Far East the most talked of and significant of the resources to be considered are the coal and iron ore of China. The coal resources, though but slightly developed, are very large, some estimates indicating that they form nearly a quarter of the world's supply. Some of the largest reserves, however, are in remote regions which will be inaccessible for commercial development for a long time to come. The only coking coal available in large quantities for metallurgical purposes is in Chihli, Fengtien, and Shansi in the north, and Kiangsi in the south.

The iron ore reserves of China, according to latest estimates, aggregate 950,000,000 tons, a figure which represents about one-fifth of the reserves of iron ore of present commercial grade in the United States. An analysis of the estimates, however, shows that much of this tonnage may not be considered workable under present conditions, due to inferior grade or remoteness from existing lines of communication, and should not be included in any comparison that is made with reserves of commercial grade existing elsewhere. For example, it includes low grade, banded hematites and magnetites in Manchuria and north-eastern Chihli, running 30 to 36 per cent. in iron, which must be concentrated before smelting. The feasibility of effecting sufficiently cheap concentration is still to be proved. In the United States and other parts of the world there are large quantities of ores of this class which have not yet been able to compete with the ores concentrated by nature, and which are not included in estimates of commercial resefves. The inclusion of these low grade ores in the commonly quoted figures of China's iron ore resources but emphasizes the real poverty of China in ores of present commercial grade.

The immediately available Chinese ores of commercial grade, not requiring concentration, and not

*Foreign affairs.

The Fushun Mines

handicapped by remoteness, from transportation, are estimated at about 100,000,000 tons about three-fourths of which are along the Yangste river, and one-fourth in the Hsuan-Lung region northwest of Peking. The first named group, which is well known, has been mined on a modern scale. It would supply the iron and steel plants of the United States for less than two years. The remaining reserves will not be able to compete commercially in the world's iron and steel business for a very long time. The present rate of Chinese iron ore production is a million tons or less a year—less than two per cent. of that of the United States. Japan now controls commercially about 90 per cent. of the available reserves.

Obviously, then, the reserves of iron ore now known to exist in China do not warrant the huge capital investment necessary to the building of a great iron and steel industry.

Much has been said about the probability of the existence of great undiscovered reserves of iron ore in China. The best Chinese iron ores are of a type which is hard and resistant to erosion, and therefore outcrop freely. It is true that native methods of smelting favored the use of softer ores, and that the value of the harder ores was not recognized by the Chinese. Nevertheless, there are few records of actual "discovery," in the geographic sense, since China has been penetrated by foreigners. The chances, therefore, of adding to China's iron resources by further exploration are not promising.

Japan is the chief consumer of iron and steel products in the Far East, but its known resources of iron ore are largely confined to one deposit, the Kamaishi Mine, in Riquchu province, with an estimated reserve of 35,000,000 tons. In various additional sources some of the Japanese estimates indicate the existence of 45,000,000 tons more, but this ore is widely scattered and much of it is of low grade. Domestic production has averaged 209,000 tons yearly for the last ten years, or less than half of one per cent. of that of the United States. Japan also has reserves in Korea, estimated at 4,000,000 tons, and from this source has imported slightly more than the domestic production. Japan's paucity of iron ore explains its activity in acquiring and developing the Yangste deposits of China and its present attempts to concentrate the low grade ores of Manchuria.

Japan is better supplied with coal than with iron ore, but compared with the other principal industrial nations of the world it is very poorly off. It has exhausted a much larger proportion of its reserves than any other country, and its industrial future is correspondingly limited. For some years the Imperial Steel works have been supplied by mixing Japanese coal with Chinese coal. Much of the coke from Japanese coal is weak and porous. The reserve of coking coal is so small that there has been much discussion of a government plan to electrify the iron works, in order to postpone its exhaustion.

The iron ore deposits of the Russian Far East aggregate hardly more than 5,000,000 tons, in scattered deposits. The only coal proved to be of good coking quality is in Sakhalin Island, where the fields are but little developed and good ports are scarce and ice-bound for several months of the year. Both iron ore and bituminous coal fields are insignificant in Indo-China. Siam has a few scattered undeveloped iron ore deposits, but the known coal is mostly lignite. The Malay Peninsula and British Borneo contain some iron ore deposits, but they are only of local importance, the aggregate being not more than 25,000,000 tons.

The situation seems more promising, at first glance, in the Netherlands East Indies, particularly in the south-eastern part of Borneo and in the central part of Celebes. The iron ore in these regions constitutes one of the largest reserves yet known in the Far East; it is estimated at 800,000,000 tons, much of it within easy reach of the sea. But this ore is of the lateritic variety, like that of Cuba and of Surigao Province in the Philippines,—a variety which, because of its content of nickel, chrome, high alumina, and mositure, has thus far presented certain metallurgical difficulties which have prevented its extensive use even in favorable locations. A furnace is now being built by a Dutch syndicate, in coöperation with the Government of the Netherlands East Indies. While there is coking coal in this region, the amount is so limited and of such a low grade that a study is being made of the possibility of electric smelting, as well as smelting with oil residue. There is reason to believe, however, that neither of these methods can be developed much beyond the point of supplying small local needs.

Panoramic View of the Penchihu Blast

The Philippines contain important deposits of lateritic iron ore, estimated at 430,000,000 tons or more, principally in Surigao, on northern Mindanao. Lignitic coal is abundant, and bituminous coal less so. Coking coal exists in very limited quantities, principally in southern Mindanao. Any iron ore industry which may develop is not likely to supply more than local demands.

It appears highly improbable, then, that an iron and steel industry on the scale of Western Europe or the United States can develop in the Pacific region of the Far East. China, with the best supply of coking coal, does not have enough iron ore of present commercial grade, and the geographic separation of the best available coking coal and iron ore is a heavy handicap. Netherlands East Indies and the Philippines have large supplies of iron ore, but very limited supplies of coking coal. Neither the ore nor the coal is of the best grade. Japan, with the largest plant capacity, largest consumption, and the best organization, lacks both coal and iron in sufficient quantities. The scattered supplies of coal and iron in all the other countries of the Far East are insignificant in comparison with the ones named. If all the coal and iron resources of the Pacific region were to be pooled under one operation, the total supplies would be adequate for a large industry; but there would still be heavy commercial handicaps, due to the grade of the iron ore and to the wide geographic separation of the best available grades of iron and coking coal, resulting probably in costs too high for successful competition with the other principal iron and steel producing nations of the world. Disregarding political boundaries, perhaps the best potential combination in the Pacific region would be between the iron ores of the Philippines and the Dutch East Indies on one hand, and the coking coal of the northeastern provinces of China on the other—the whole under the management of the Japanese.

There remains to consider the iron and coal resources of India. Here are large reserves of high grade iron ore, estimated at upwards of one and one-half billion tons. These ores, though considerably less in quantity than the ores of the United States and Western Europe, are far the largest and best of the iron ore reserves of the Far East. It is much less certain that there is an adequate supply of coke in India, notwithstanding large reserves of coal. A committee of the Indian Government, appointed in 1920, indicated the probable exhaustion of the coking coal within forty years, but more recent discoveries are said to have increased the known reserves. (Much of the coal is vitiated by high phosphorus and ash content.) Production of iron and steel is as yet on a small scale, but the capacity has increased faster than has local consumption, pointing to export to Western Europe as the natural outlet. In summary, it may be said that the supplies of raw materials in India are adequate for the growth of a large iron and steel industry. The limiting factors are the small capacity for local consumption and the distance from the principal foreign markets. In the immediate future the mining industry will depend for growth mainly upon exportation, which is another way of saying that it will be dependent upon western industrial centers.

It is sometimes argued that even if the quantity and quality of the resources in the Far East do not favor the development of an iron and steel industry on a profitable commercial basis, such a development might still be effected, at a cost, for political and military reasons. This argument fails to take into account the fact that such an industry involves huge capital outlays, for thousands of plants, not only those necessary for the primary conversion of the raw materials, but for the finishing and manufacturing necessary to put the iron and steel into the highly varied forms used by the ultimate consumer. The financial strain involved in going much beyond the output determined by normal commercial feasibility would test the resources of even the financially strongest countries of the world, and it is hardly to be expected that the financial resources of the Far Eastern countries will permit much building of this kind.

Oil Resources.—The oil produced in the Dutch East Indies, India, British Borneo, and Japan aggregates about 3 per cent. of the world's production. Of this about half comes from the Dutch East Indies. There are large possibilities for further development, particularly in the Dutch East Indies, in New Guinea, in the Philippines, in China, and in Sakhalin Island. The last named locality, nominally Russian, but under Japanese commercial control, is regarded as particularly promising. But while larger production may be expected in the Far East, there is nothing in sight to indicate that it will ever be a dominant world source ranking with the United States and Mexico, or with south-eastern Europe and western Asia. Local needs will be supplied, and the rest of the oil will be exported to parts of the world where industry is already established. Much of the oil production of the Dutch East Indies has been simply tributary to European demands, and will doubtless remain so. Moreover, in the absence of a general industrial development based on adequate supplies of all the essential minerals, particularly iron and steel, oil development alone has nowhere brought about a high degree of industrialization.

Copper.—Japan is the only large producer of copper in the East, yielding about five per cent. of the world's total in 1924. The size of the copper reserves of Japan promises the continuance of production on the present scale, but little more. Outside of Japan the production of copper in the Far East is negligible, nor is there anything highly promising in sight.

Lead and Zinc.—The lead and zinc production of Asia is insignificant, the total production in recent years from all countries being four to five per cent. of the world's total of lead and less than two per cent. of zinc. The outstanding lead field is the newly-developing Bawdwin district of Burma. There are other undeveloped deposits in China, but there is little hope that any of these will prove to be large, and as yet nothing promises any considerable change in world proportions. If there are to be any important new deposits revealed, present high prices should soon bring them out.

Gold and Silver.—Gold is scattered in small amounts through Japan, China, Korea, British India, and the Dutch and British East Indies, but the aggregate yield of them all was only seven per cent. of the world's total in 1924. Much the same may be said in regard to silver, the total of eastern Asia for 1924 being about four per cent. of the world's output. The most promising silver development is in the Bawdwin field of Burma, where silver occurs in the lead ore. Gold and silver have been objects of search in the Far East for centuries, with results so unsatisfactory that there are no great hopes for anything better in the future.

Minor Commercial Minerals.—The Far Eastern countries produce considerable amounts of minor commercial minerals, though no one country has any strong combination of them. China is the main source of the *antimony* supply of the world, supplying over 75 per cent. Ceylon has long dominated the markets for flake *graphite*, but is now overshadowed by Madagascar. Korea is an important producer of amorphous graphite. *Phosphates*, used as fertilizers, are being mined in increasing amounts from various Australasian islands, particularly from Ocean Island (English) of the Gilbert group, the Isle of Angaur (Japanese) of the Pellew group, Tahiti and Makatea (French) of the Society group, and the Isle of Nauru (English) of the Marshall group. The sum total, however, is less than ten per cent. of the world's production. India produces nearly a quarter of the world's *chrome* ore, being second only to southern Rhodesia. In recent years, also, India has produced between a third and a half of the world's *manganese* ore. The most important *tin* region of the world is in the Malay Peninsula and the adjacent islands of the Dutch East Indies. Siam and China produce minor amounts. These countries together produce about 65 per cent. of the world's total. Over one-half of the world's production of *tungsten*, an important alloy in steel, comes from China, and about 15 per cent. from India. This is a comparatively recent war and post-war development.

Undiscovered Resources.—But what about yet undiscovered resources in the Far East? There is a popular notion that it is largely an unexplored area. It may be pointed out that really large mineral deposits usually have some surface or geologic indications, which are likely to be known in densely populated regions characteristic of the Far East. Up to recent years certain minerals like tungsten, and zinc in the form of carbonate, were not recognized by the natives as valuable, suggesting that there are still possibilities for the discovery of ores not previously known as valuable. But as a matter of fact nearly every so-called discovery in recent years has been really a re-appraisal of a mineral occurrence already known. It has been comparatively easy for explorers to go directly to most of the known mineral indications, except in the far hinterland, and their activities for several decades have yielded results far less notable than those obtained by equivalent exploration in the great mineral-producing regions of the world. Liberal allowance is to be made for the fact that, on the whole, exploration in the Far East, particularly in the hinterland, has not yet been nearly as intensive as in western industrialized countries, and that much miscellaneous development of mineral resources is naturally

to be expected. But the fact remains that the considerable mass of information already collected has a decidedly negative bearing.

Conclusion.—The Pacific region of the Far East is deficient in essential minerals necessary for the development of a great industrial civilization, when considered in relation to their location, grade, and relative quantities. The more conspicuous deficiencies are in iron ore, coking coal, copper, lead, and zinc. India alone has really adequate iron and coal deposits, but even here the supply of coking coal is apparently far less than in the industrial nations of the West. Many of the minerals which are produced in abundance, like tin, tungsten, antimony, graphite, manganese, and chromite, are largely exported to the Western world, for the reason that they are of use maninly in a highly industrialized society and are not in themselves a sufficient basis for industrial organization. Inertia of invested capital will in itself tend to keep the balance of mineral control in the West. If all of the Far Eastern resources could be combined, they would still be far inferior to those of Western Europe or the United States.

This situation cannot be attributed simply to lack of exploration. There has been exploration enough to disclose the probable main outlines of the future.

In so far as the possession of adequate mineral resources is a necessary basis for building future industrial, political, and military power, the countries of the Far East are proportionally handicapped,—the Pacific region more, India less. Whatever progress there may be must necessarily be of a kind produced by other factors. Supremacy resulting from the possession of mineral resources will remain centered about the North Atlantic. "The white man's burden" is partly one imposed by nature's distribution of raw materials.

It remains to consider the human elements in the problem. It appears, at least up to the present, that the kind of skill, organizing power, and initiative necessary for the effective use of mineral resources is found to a notable degree where the nost adequate resources are found, namely in the countries bordering the North Atlantic. Conditions there have of course afforded the best opportunity for bringing out these qualities. Thence have radiated the influences which have initiated most of the mineral developments in other parts of the world. Whatever the latent capacity of the peoples of the Far East for undertaking mineral developments, the physical conditions do not promise opportunity for rapid progress, in its expression. Even though the potential resources were equal, which they are not, it remains to be proven that the human qualities necessary for their use are likewise equal, notwithstanding such conspicuous exceptions as are exhibited in Japan or in the Indian steel industry.

From the standpoint of mineral resources, therefore, we may regard the Far Eastern countries, not as challenging western supremacy, but as calling for our sympathetic coöperation in their contest with unsatisfactory environmental conditions.

World demand will continue to force the development of such resources as exist in the Far East, and this will require that capital and skill be supplied from the world's industrial centers. Japan, in taking a leading part in this movement, is merely doing what other industrial nations are doing the world over. Whatever we may think of the political desirability of this movement, it is a reality, based broadly on civilization's mounting demand for raw materials, and it probably cannot be stopped or even materially slowed up by any action of individuals or of governments.

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1 The "Far East" is here used to include India, Eastern Asia, and the adjacent islands of Japan, the East Indies, and the Philippines. It is subdivided broadly into the Pacific region and India.

2 No attempt is made to treat the subject exhaustively in this article. Readers interested in following this subject further are referred to:

"The Iron Ores and Iron Industry of China." By F. R. Tegengren: Memoirs of the Geological Survey of China, Ser. A, No. 2, in 2 parts, with atlas, 1921-1924.

"General Statement on the Mining Industry of China." By V. K. Ting and W. H. Wong: Special report, Geol. Survey of China, No. 1, June, 1921.

Reports of the Imperial Mineral Resources Bureau, London.

"The Mineral Industry." Published annually by McGraw-Hill Book Co., New York.

"World Atlas of Commercial Geology." Part I, Distribution of Mineral Production: U. S. Geological Survey, 1921.

"The Iron Ore Resources of the World." XI International Geological Congress, Stockholm, 1010, 2 volumes, with atlas.

"The Coal Resources of the World." XII International Geological Congress, Toronto, 1913, 3 volumes, with atlas.

"Geology and Mineral Resources of the Philippine Islands." By Warren D. Smith: Pub. No. 19, Bureau of Science, Manila, 1924.

"Certain Iron-ore Resources of the World: China." By H. Foster Bain: Trans. Am. Inst. of Min. & Met. Engrs., vol. 61, 1919, pp. 132-135.

"Recent Development in the Iron and Steel Industry of India." By Charles Page Perin: Am. Iron and Steel Inst., 1920.

"The Mineral Resources of China." By C. Y. Wang: Tientsin Press, Ltd., 1921 or 1922.

Mr. Strawn Comes to China

(Continued from page 256).

except as it is recognized by the foreign Powers. The Chinese people in no articulate manner recognize this so-called government. Very few of the provinces recognize it. It has no revenue except from the Customs as collected under foreign supervision. It has no way of originating revenues, except on foreign goods. In a word, China is bankrupt, insolvent and not a government, in the sense that any central authority has any power in the country. Real governmental authority is exercised by the provinces and by the feudal militarists who in some places maintain a fairly efficient administration. The provinces are, on the whole, against the $90,000,000 going to Peking because that means that the party which at the moment of agreement dominates Peking would have all the benefits. Therefore, the $90,000,000 revenue increase is to be imposed on the consumers against their wishes and at the expense of foreign imports, principally American goods. Mr. Strawn should have understood this, but apparently he did not, for he not only agreed to the Chinese proposal, but he caved in completely on the question of tariff autonomy.

The Powers have no intention of granting China tariff autonomy in 1929 as promised. That promise was made by the delegates under the leadership of Mr. Silas Strawn, at the moment when they were swept off their feet by the brilliant diplomacy of Dr. C. T. Wang. It is generally reported that the Powers have something up their sleeves by which they hope to evade their promise in this respect. The fatuity of their belief startles foreigners in China. For whereas it is true that no treaty has been signed and that no concession in this direction has been made with any sense of legality, the fact nevertheless remains that the Chinese people *believe* that it has been made. During the year, 1929, when the promise falls due, there will be the usual popular uprisings, strikes, boycotts and demonstrations, to demand that the promise lightly given and never ratified, be fulfilled to the limit. What will Mr. Strawn and his confrères say then? They will probably be in their own countries academically viewing from a safe distance the havoc they have wrought. And their nationals in China and the Chinese people will be holding the sack.

The Market for Belting in Chosen

The local industries constituting the principal markets for machinery belting in Chosen are, in order of their importance, rice mills, industrial plants, and mining operations. There are a few more than 400 grain cleaning (mostly rice) mills scattered throughout the country, of which about 90 per cent. are small mills. Under industrial plants may be included the workshops of the Chosen Government railways, several dozen electric companies, five large iron foundries, several large sawmills, and a number of miscellaneous factories. The chief enterprises of the mining industry are several large gold mines and one large coal mining station. Aside from these there are many smaller mines in which a certain amount of modern power machinery is being used.

Most of the belting used locally is for power transmission in rice mills and industrial plants. Mining operations and agricultural developments (irrigation and pumping) follow in importance of the quantities of belting used.

Leather belting ranks first, and canvas second, in extent of use in Chosen. Canvas belting has proven satisfactory in operations where a cheap but serviceable belting fills the requirements. Balata belting is being introduced and seems to be meeting with fair success. Rubber belting has not as yet been successfully introduced here.

There is no local belting industry. Practically all the belting used by the local industries is supplied by Japanese manufacturers. The figures for the amount of leather belting imported in the first nine months of 1925 was Y. 89,376 from Japan and Y. 2,647 from other countries.

Pretoria Municipal Power House

IT will be interesting before proceeding to describe the new Municipal Power Station of Pretoria, to glance briefly at the early history of electricity supply in that City.

In 1891; private enterprise first made a supply possible, and the difficulties that the pioneers had to face will readily be grasped from the statement that Pretoria was at that time 200 miles from the railhead.

The first installation consisted of five belt driven generators, and it is interesting to record that Mr. T. C. Wolley-Dod, the present Electrical Engineer to the Pretoria Town Council, was one of the party who transported these units by ox-wagon; it has been largely due to his energy and initiative that Pretoria now possesses so modern and up-to-date a plant.

Once power was available its use rapidly spread, and within ten years the output of the station had increased to six times that of the original demand. Between 1891 and 1919 the station was reconstructed three times on the original site, the undertaking having in the meantime been taken over by the Municipality in 1902. With a still rapidly increasing demand, it was obvious that further provision would have to be made. At first it was thought that a reconstruction of the original power house (which was in the centre of the City) might serve the purpose, but when Mr. G. M. Clark, M.A., M.I.C.E., etc., was appointed Consulting Engineer to the scheme he decided that it was best to build a completely new power house with turbine-driven generating plant.

A site was chosen some three miles from the centre of the City and building commenced in 1922. At this site a railway siding for handling coal could conveniently be obtained, and a water supply for condensing purposes could also be provided. Further, unlimited land was available for future extension.

It was proposed that the new station should at the start be designed for an output of 10,000 kw., and that the original station (Schoeman Street) should be adapted for a converter station with five 750 kw. motor converters, including one to supply the trams, one to act as spare, and the others to supply the old D.C. area in the centre of the city. Apart from this, the principal load consists of the public works department, railway workshops and Government offices, while there is also a useful domestic load. Certainly, the utility of this load will at once be appreciated from the statement that its load factor is 40 per cent., a figure which will be envied by many English Power Station Engineers.

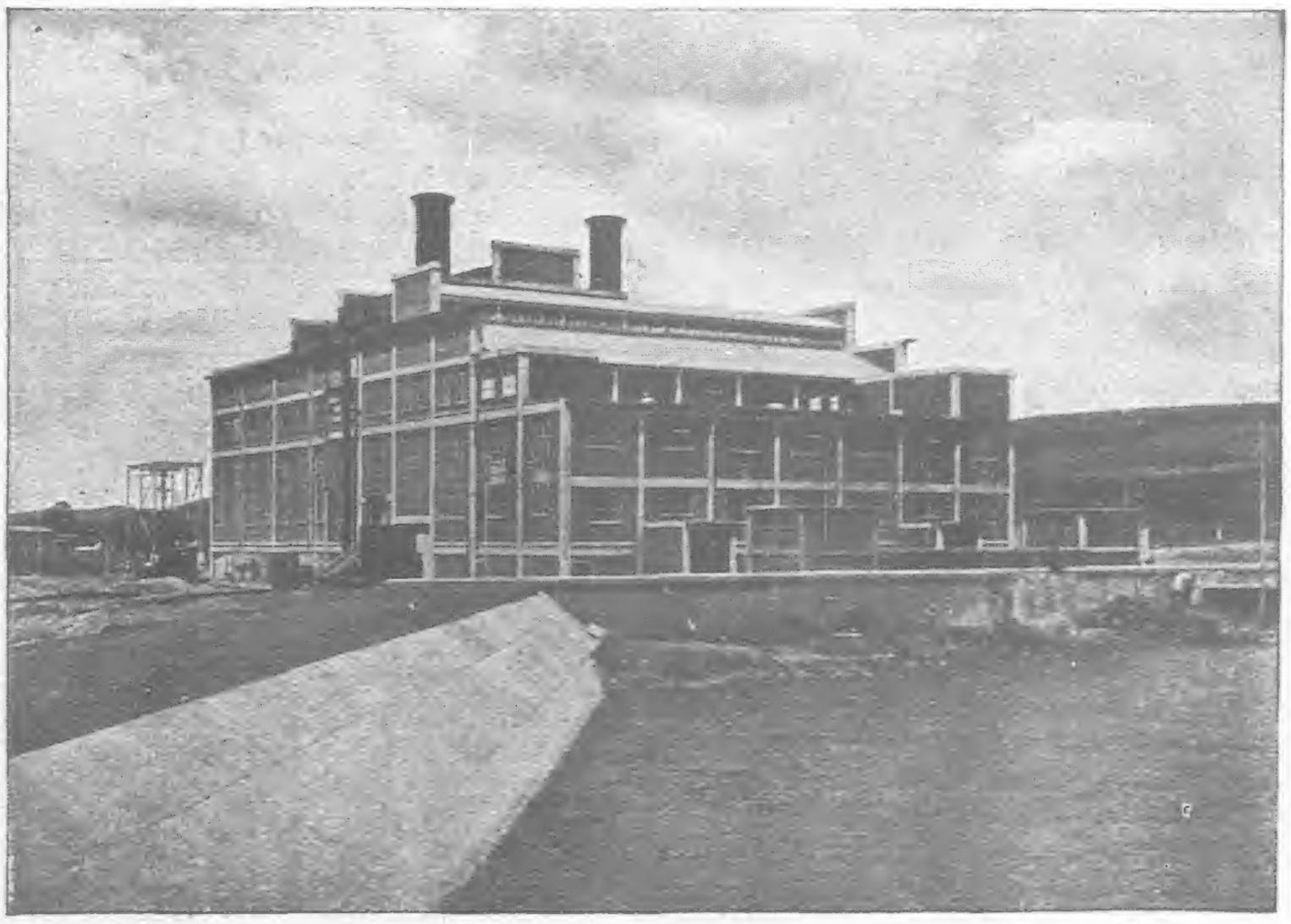

Fig. 1.—General view of Pretoria Municipal Power House, with corner of dam in foreground.

Reference has been made above to the fact that a supply of water was available for condensing purposes at the new site. The source of this was a stream from which, by the erection of a dam, it was possible to store 100 million gallons of water, with a top water surface of 35 acres for cooling the circulating water by natural evaporation.

The first work put in hand was the construction of the dam, which was made with natural earth faced with cement slabs to prevent erosion of the wall by wind and wave action. The circulating water is brought through a concrete conduit under the basement of the engine room, whence, after passing through the condensers, it is taken through a concrete flume to the extreme southern end of the dam. A good general idea of the station, with a corner of the dam, is given in Fig. 1, which also shows the concrete slabs on the face of the dam. On the right of the illustration is shown a square valve tower, unit, in which are placed screening arrangements on the intake side of the water conduit, which is placed at such a level that the dam can still be used when it has sunk to about 13 ft. after a prolonged dry season. Further to the right is the rising circulating water discharge pipe to the concrete flume that leads up to the further part of the dam. The hills on the extreme right behind the power station form the catchment area from which the dam is filled by collecting the rain precipitated.

The construction of the power house building presents several features of interest. This is largely due to the fact that Mr. G. M. Clark, the Consulting Engineer, was also responsible for the design of the buildings. The power station is of reinforced concrete monolithic structure, and all stresses are carried on beams and columns. There is an exterior panelling of brickwork, but this carries no stresses. In order to prevent heat from the outside atmosphere reaching the interior of the station, the walls are hollow with 1½ in. air space between 4½ in. bricks. All foundations are taken direct on to rocky shale, the bases of the concrete columns being carried to this solid foundation. Concrete columns and beams support the 20-ton crane in the engine room. As illustrating the forethought displayed in connection with the scheme, concrete cells for the high tension switchgear were included as a part of the original building lay-out.

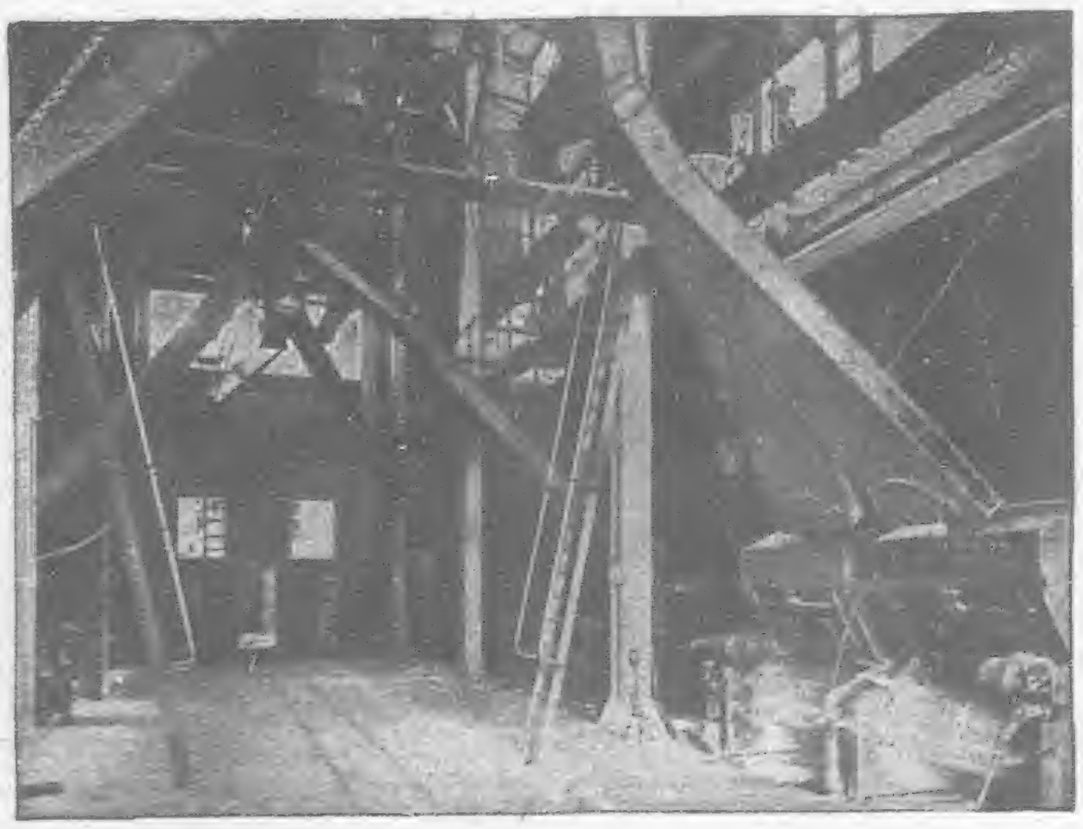

Fig. 2.—The Boiler House with electrically-driven auxiliaries.

The colour scheme of the exterior has been so designed as to harmonize with the picturesque surroundings of the power station site, the bricks being red, and forming a pleasing contrast to the concrete.

The concrete is obtained locally, the cement used being Pretoria Portland Cement, while the steel for the reinforcement is also of South African manufacture coming from Vereeniging. The roof is of corrugated galvanised iron sheets attached on both sides to the purlins; the construction is such that an air space is provided, thus keeping the temperature of the engine room from being raised by the direct heat of an almost tropical sun.

To the left of Fig, 1 is seen the steel structure of a transhipper for transferring loads of 20 tons from the main siding to an entrance into the building seen below the left chimney stack.

The bays are arranged respectively for boiler house, pump room, engine room, and two for switchgear, while above the switchgear house is an Engineer's record room with bathrooms, etc., for the staff.

A great feature of the building is the lighting. The large windows on all sides of the building are mainly responsible for this. In addition the engine room basement is half above and half below the ground level, so that natural light is freely admitted to the basement.

The design of the building is arranged so that boiler and engine rooms and all machinery are at the same level, this level being determined by the minimum water level to be anticipated in the dam, and this raises the level of the floor about 8 ft. above the normal for ash collecting. The ashes can thus be dealt with from the basement which allows this generally disagreeable task to be performed with a minimum of trouble.

Turning now to steam arrangements, the boiler pressure decided upon was 350 lbs. per square inch with a final steam temperature of 600° F. and it should be pointed out that the wisdom of this decision has already been justified from the point of view of economy. The boiler equipment consists of six Babcock & Wilcox Marine type Boilers with electrically driven chain stokers; a general idea of the arrangement being given in Fig. 2, the photo from which this reproduction was made having been taken in the boiler house when in operation. Each boiler has a normal capacity of 20,000 lbs. per hour, though this can easily be worked up to give 30,000 lbs. per hour. The boilers are fitted with steel tube economisers with a main flue above the economisers. The chimney stacks are 7 ft. 6 ins. in diameter and are fitted with induced draught fans. The motor of one of these fans can be seen in Fig. 2 under the right window in the background. There are two fans per stack.

Coal is brought to the sidings in hopper bottomed trucks the largest of which is capable of a load of 50 short tons (2,000 lbs.) It is discharged into a hopper and thence to a belt conveyor which runs in a tunnel to the boiler house. From the belt conveyor the coal is raised by bucket elevators to a second conveyor which discharges into overhead steel bunkers whence the coal travels via chutes to the boilers. At the top of each chute is a coal valve which discharges 700 lbs. at each filling. About 100 tons of coal is kept in overhead bunkers and provision is made for storing and handling up to 3,000 tons on site. The coal is untouched by hand from the colliery till the time it is reduced to ashes and discharged into coco pans which are wheeled away by native labour.

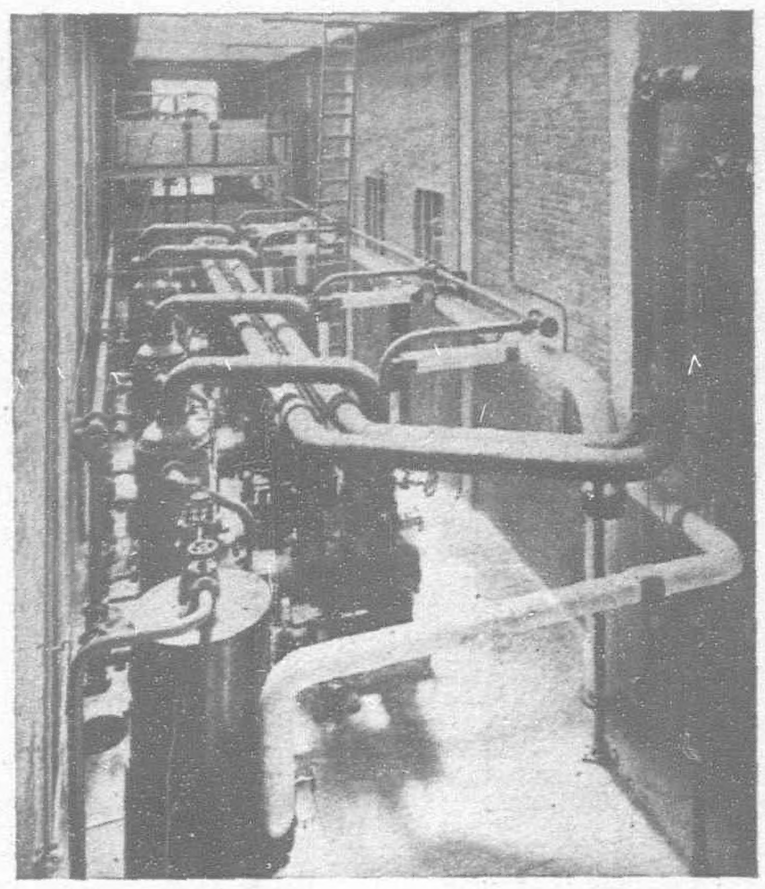

Fig. 3.—The Pump Room, with feed water heater and measuring tanks.

Referring now to Fig. 3, turbo feed pumps, feed waterheaters, and measuring tanks are clearly seen. The pumps are by G. & J. Weir each having a capacity of 7,000 gallons per hour against full pressure; the speed is 6,000 r.p.m. The exhaust from the pumps is taken to feed water heaters, and the boiler feed water into drums from which it is distributed to either or both of the duplicate feed ranges. In the foreground is seen a Weir's evaporator which, following ordinary marine practice, is used for providing the make-up. The pump room lies between the engine room and boiler house and also there is a motor air compressor which supplies air to all parts of the station for various purposes, being used *inter alia* for blowing soot from boiler tubes; this saves a large number of small joints on the high pressure steam ranges.

In the layout of the pump room and piping system a colour scheme has been adopted so that the geography of the station is abundantly evident to any engineer, who can read it almost at a glance. Thus the main steam pipes are white; exhaust pipes, yellow; feed ranges, chocolate red; fire service, vermilion; town water supply, green; compressed air, blue; and small drip pipes, black or grey.

The steam pipe flanges are rivetted with a mild steel ring inserted to form a caulking piece, except at the junction of pipes to valves when bolted joints have been used with serrated flanges.

The engine room is equipped with three 3,500 k.v.a. G.E.C.—Fraser & Chalmers Turbo-alternators, together with high and low tension switchgear, as shown in Fig. 4. Power is generated at 6,600 volts, 50 cycles, and transmitted by 3-phase, 6-core underground cables to the old power station three miles away, to which reference has already been made. Two pairs of cables form a ring main to supply A.C. at various points of the western end of the city, while a third cable forms a diameter to the ring and runs straight to the old Station. The eastern end of the city is supplied with A.C. by a second ring main from the Schoeman Street Station.

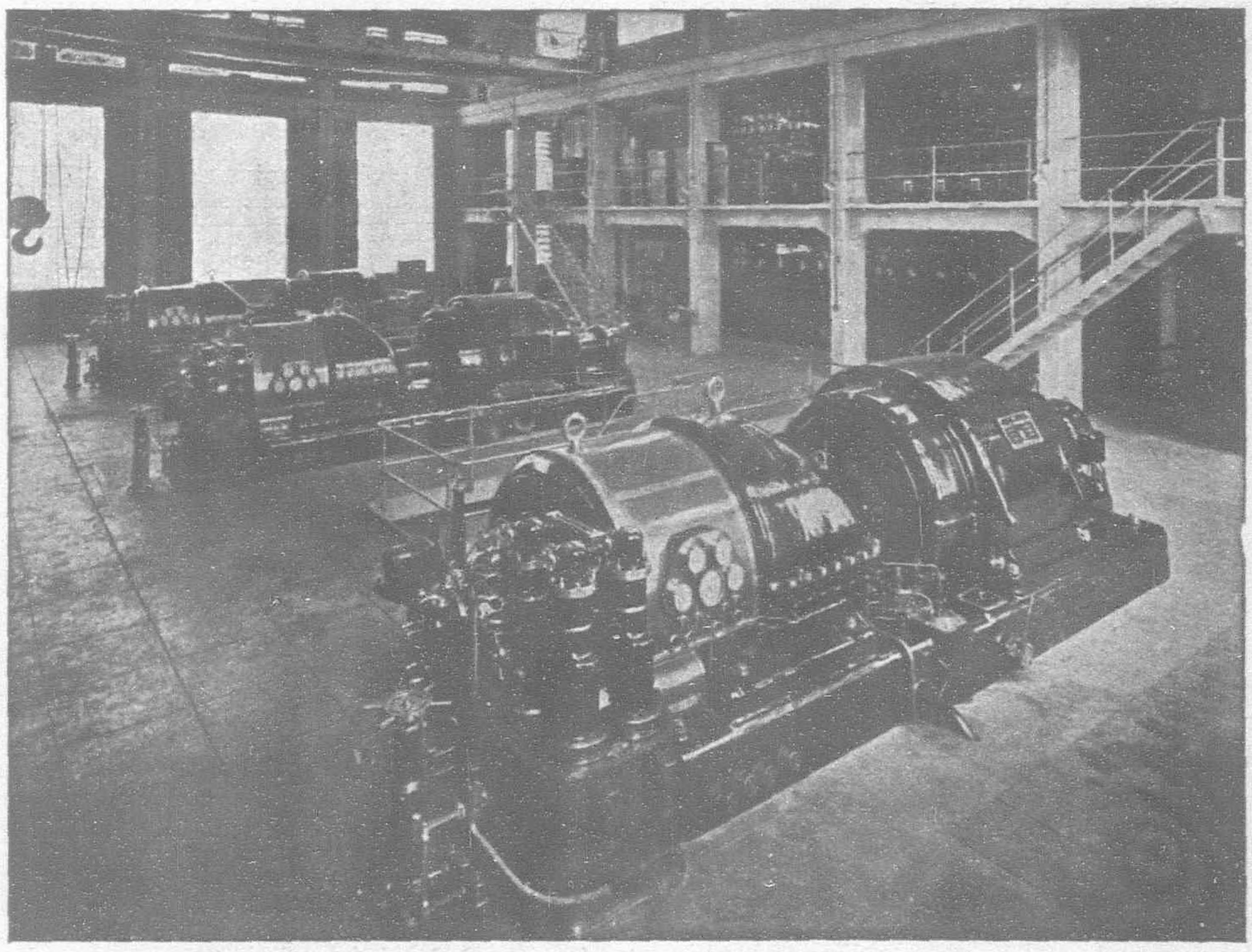

Fig 4.—General view of Engine Room with three G.E.C.-Fraser & Chalmers Turbo-alternators and G.E.C. Switchgear.

The turbines which are of the impulse type were manufactured at The General Electric Co.'s Fraser & Chalmers Engineering Works, Erith. They are of particular interest in so far as they are designed for a working steam pressure of 350 lbs. per sq. in. gauge, with total temperature 600° F.

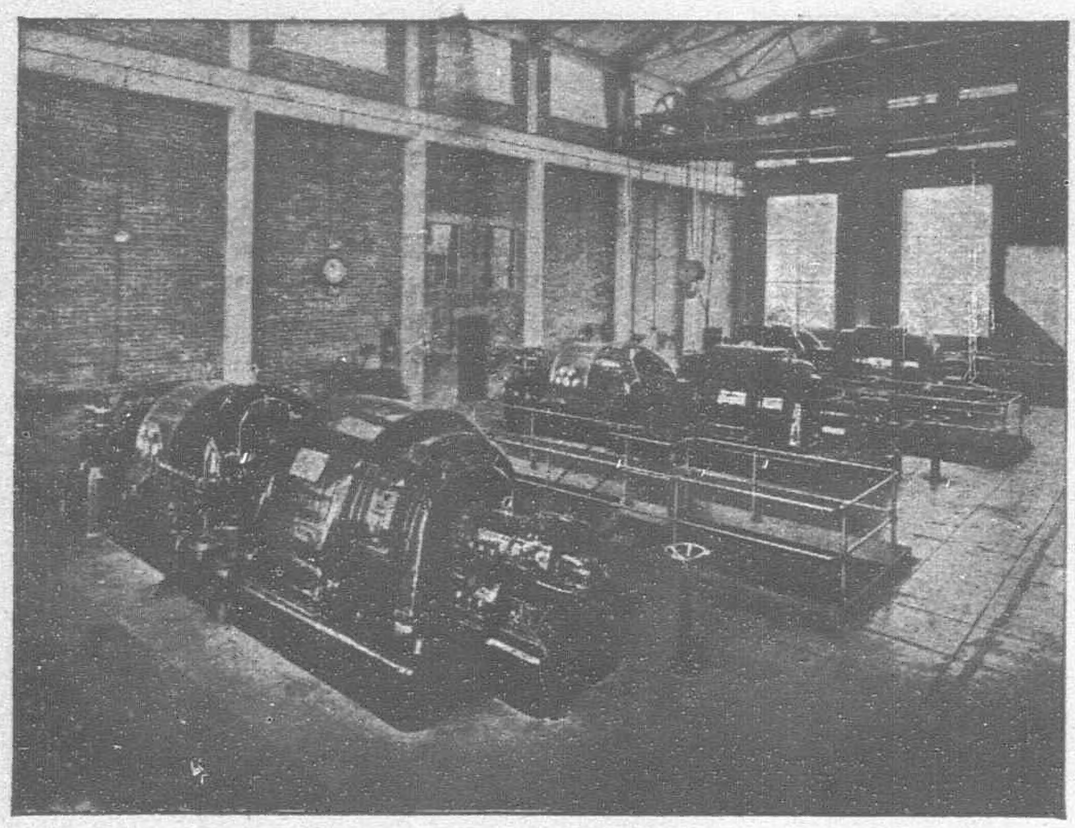

Fig. 5.—The three 3,500 k.v.a. G.E.C.-Fraser & Chalmers Turbo-alternators from the alternator end.

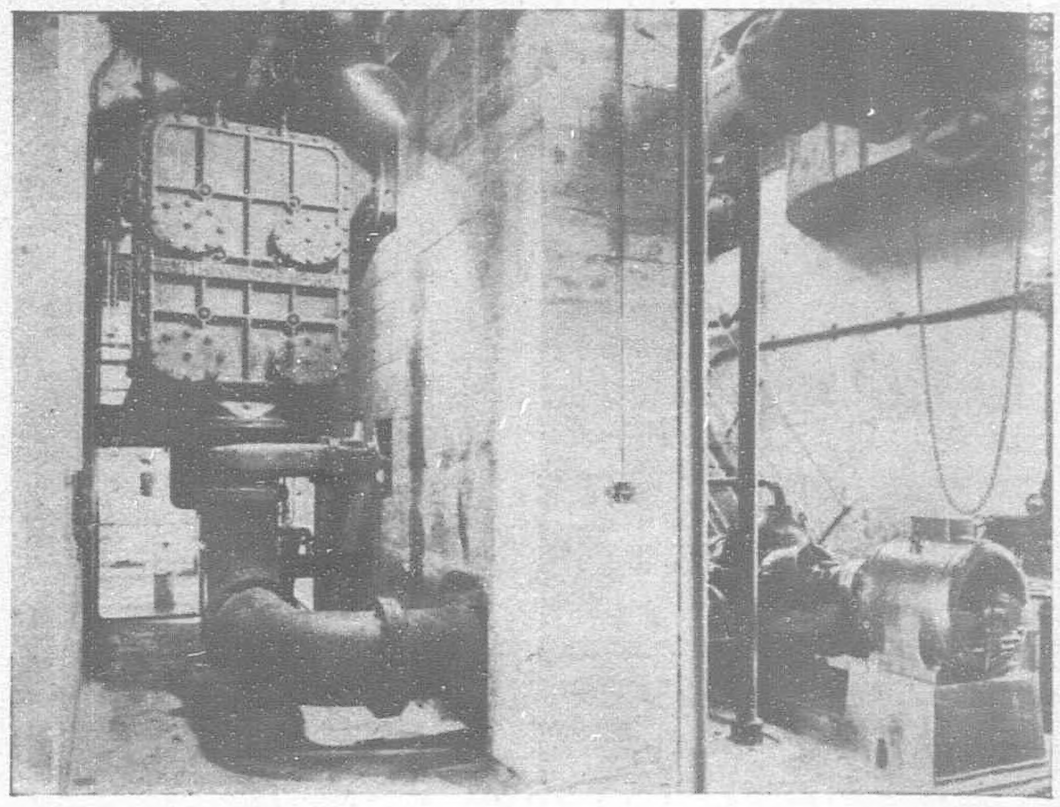

Fig. 6.—View in basement showing to the left, condenser; to the right, circulating pump motor.

and vacuum 95 per cent. It should be noted that the station stands 4,360 ft. above sea level, and the barometer normally stands at 25.5 ins.

The steam supply to each turbine is controlled by three throttle valves all of which are automatically operated by the governor through oil relays in accordance with the maker's standard practice. The first or main throttle valve enables the machine to carry ¾ load. This valve is contained in a separate steam chest. The other two throttle valves which carry full load and 5/4 load respectively are arranged together in a second steam chest. The sub-division of the steam chest into two independent portions was adopted with a view to obtaining reliable steel castings, simple in design. The steam chests are rigidly bolted to the bottom half of the high pressure casing. The steam leaving the steam chests enters the steam belt formed in the high pressure casing. The nozzles for the first expansion of the steam are fixed to the steam belt in the bottom half only. No live steam is admitted into the top half of the high pressure casing.

The steam belt of the bottom half casing is closed at the horizontal joint. This arrangement has the great advantage that none of the joints which have periodically to be broken for the purpose of examining the interior of the turbine are subject to live steam pressure. The steam pressure after the first expansion is no greater than in turbines of similar capacity working with moderate live steam pressure. This is necessary in order to keep the ventilation and gland leakage losses within reasonable limits. It has the further advantage that no special difficulties arise to keep the longitudinal joint steam tight and that no undue stresses are imposed on the casing.

The heat drop of the first expansion is considerable, and a velocity compound stage has therefore been provided in order to secure the best possible blading efficiency. In addition, there are eight single impulse stages. In all the details the turbines follow strictly the standard Fraser & Chalmers design.

The machines having now been in operation for nearly a year, it is possible to state that they have proved capable of the economy guaranteed.

The condensers are by Worthington-Simpson, each have a cooling surface of 6,000 sq. ft. A view of one unit is shown in Fig. 6, which also shows on the right hand a squirrel cage "Witton" motor driving one of the circulating pumps. This motor runs on a 500 volt. circuit, and is typical of the class of machine used for the drive of the various auxiliaries. Each motor is started by an auto-transformer starter, an oil circuit-breaker being also provided for the main control. A further view of some of the auxiliaries is given in Fig. 7, and it is very interesting to note that the photo from which this illustration is reproduced was taken entirely by natural light, and thus provides a wonderful example of the lighting of the basement, to which reference has already been made.

The alternators are of the G.E.C. standard design, with normal full load output of 3,500 k.v.a., supplying 3-phase, 50 cycle, current at a voltage of 6,600; the speed is 3,000 r.p.m. The machines were designed for a power factor of .8, but in view of the converter load it is nearly unity. These machines embody all the many features which have made G.E.C. high speed alternators so reliable and efficient. Throughout the design and manufacture every care is taken to ensure that none but the very highest quality materials are used, and these are subject to the strictest tests before being put into use. The stators are cast in the Witton foundry, whilst the rotors are of the solid drum type produced from a single forging.

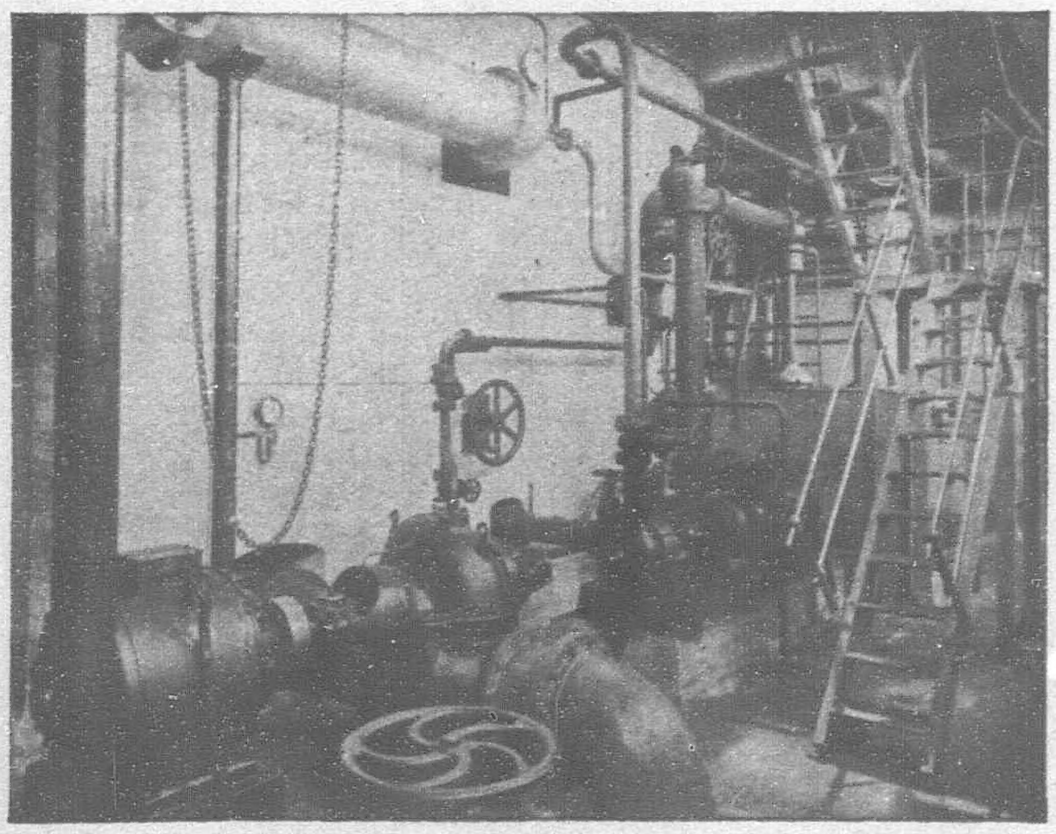

Fig. 7.—Some of the auxiliaries in the basement.

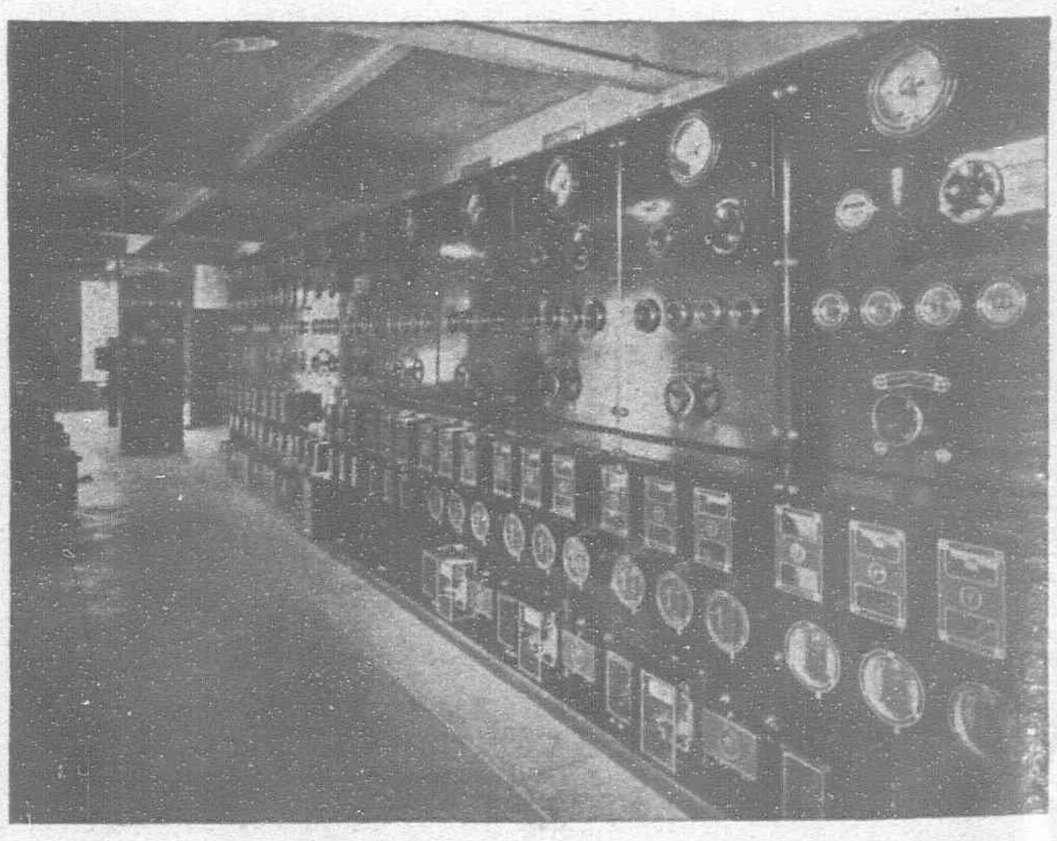

Fig. 8.—Main Control Board for 6,600 volt electrically operated switchgear in concrete cubicles.

The insulation of the windings is a matter of first importance, and the highest grade of mica obtainable is used wherever possible. The ventilation system is designed on thoroughly scientific lines, one feature being that the air which cools the rotor is kept apart from that which cools the stator during their passage through the machines.

The Power House Switchgear is divided into three main sections, first, a 6,600 volt, stonework cubicle board with electrically operated oil circuit breakers secondly, a steel plate cubicle board with slate front for the 500-volt circuit supplying power to the auxiliaries and for lighting; and thirdly, the auto-transformer starting panels for the auxiliary motors. The last may be briefly dismissed it being sufficient to say that they are of standard G.E.C. design.

Considering the general lay-out of the main 6,600 and 500 volt switchboards, the control board for the former is on a gallery overlooking the engine room while the steel plate cubicle board is immediately below. This arrangement is shown in Fig. 4. The stonework cells for oil circuit breakers, links, and instrument transformers are in a room immediately behind the 500 volt board, and on the same level, *i.e.*, on the main deck. On the floor above these cubicles, and in a room immediately behind the control board are the bus-bar cells. The whole of the different sections of the gear may be seen in Figs. 8 and 12.

The high tension gear is accommodated in 9 stonework cubicles which comprise the following:—three main generator cubicles, for the 3,500 k.v.a. alternators, one bus-bar coupler, two works cubicles, for supplying the auxiliary plant, and three 2,200 k.v.a. feeder panels. A duplicate bus-bar system with duplicate links is installed, both the sets of links being mounted on the oil circuit breaker side of the cubicle so as to facilitate inspection. The breakers are commodated in a row of cubicles fronting in one direction, while the instrument transformers, etc., are in a row of cubicles backing on them and fronting in the opposite direction; this also makes for ease of inspection.

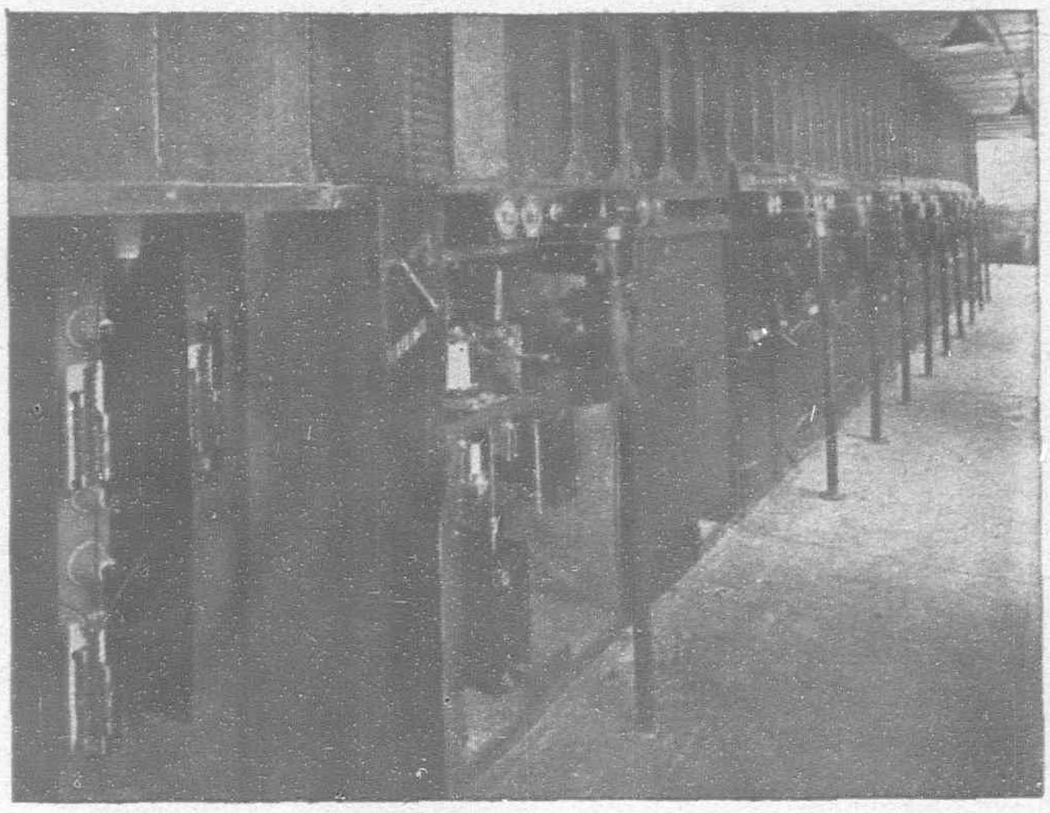

Fig. 9.—Front of 6,600 volt G.E.C. Concrete Cubicle Switchboard showing solenoids for electrical operation.

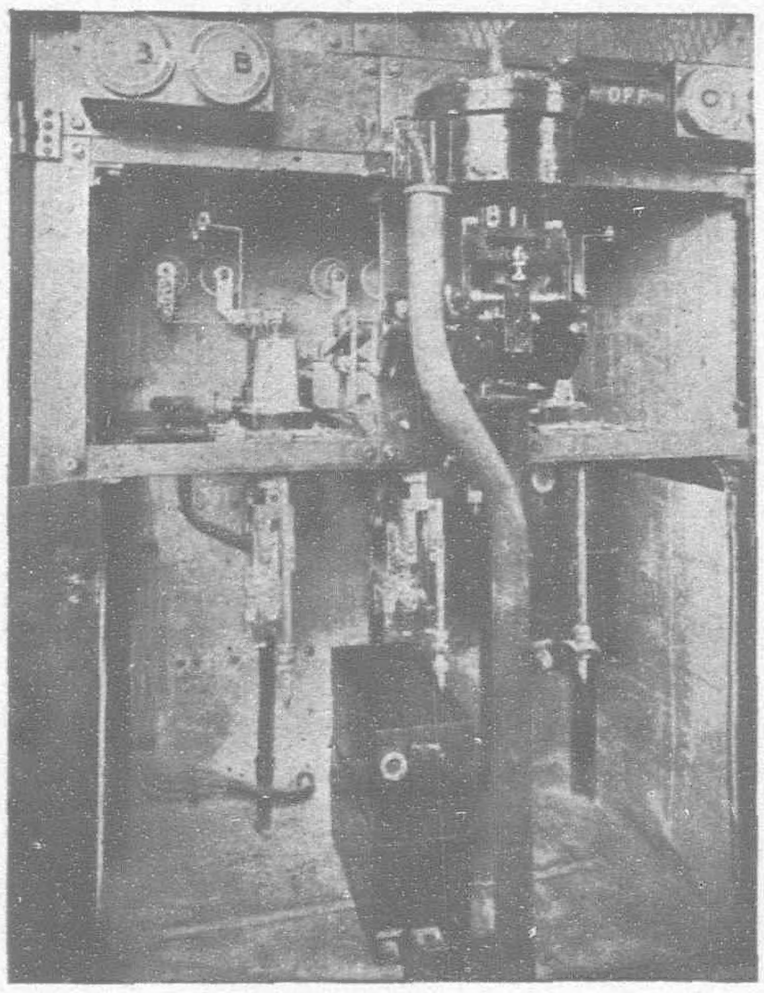

Fig. 10.—Interior View of one of the 6,600 volt Stonework Cubicles showing Type IV. T. G.E.C. electrically operated Oil Circuit Breaker, maximum breaking capacity 125,000 k.v.a.

The control board consists of the usual flat back slate panels, and is equipped with instruments and relays which will be briefly summarised. Apart from the main operating handle for energizing the solenoid which controls the breaker, the main generator panels have mounted upon them three ammeters, an indicating wattmeter, watthour meter, power factor meter, voltmeter, two reverse relays, a time limit overload relay, and protective relays. The works panels are equipped with ammeter, protective relay and time limit overload relay; the feeder panels have ammeter, watthour meter, split conductor relay, overload relay, and definite time limit relays.In addition there is a synchronizing pillar with two voltmeters (one being of the central zero pattern) and a 12-in. synchroscope, also three exciter panels of the desk type on the opposite side of the gallery, so arranged that if the generator breaker trips due to an internal fault the exciter is automatically short circuited through a resistance. If the breaker trips on overload the field switch is not actuated. It should also be mentioned that the neutral point of each generator is earthed through a resistance.

The oil circuit breakers are of the G.E.C. Type IV. T. designed for electrical operation; they have a maximum breaking capacity of 125,000 k.v.a. It will be seen by reference to Fig. 10, that each phase of the breaker is in a separate tank, and that two tanks were lowered when the photo was taken, so as to give a view of the contacts. These breakers, in common with all oil circuit breakers designed by the G.E.C. have a long double break in each phase, while by means of a direct acting spring the speed of break for each set of contacts is at least five ft per. second, giving a total minimum rupturing capacity of 10 ft. per second. Other features of these breakers to which reference may be made is the absence of any porcelain in tension; the provision of a large

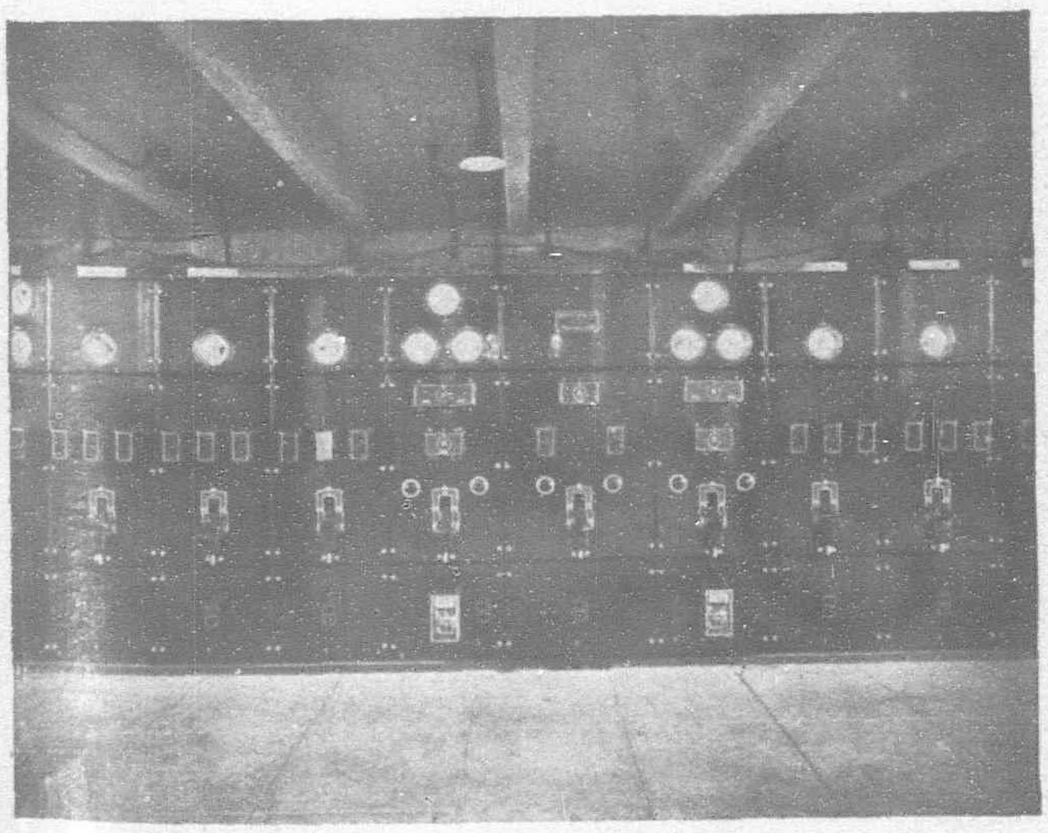

Fig. 11.—550 volt G.E.C. Steel Plate Cubicle Board with slate panels.

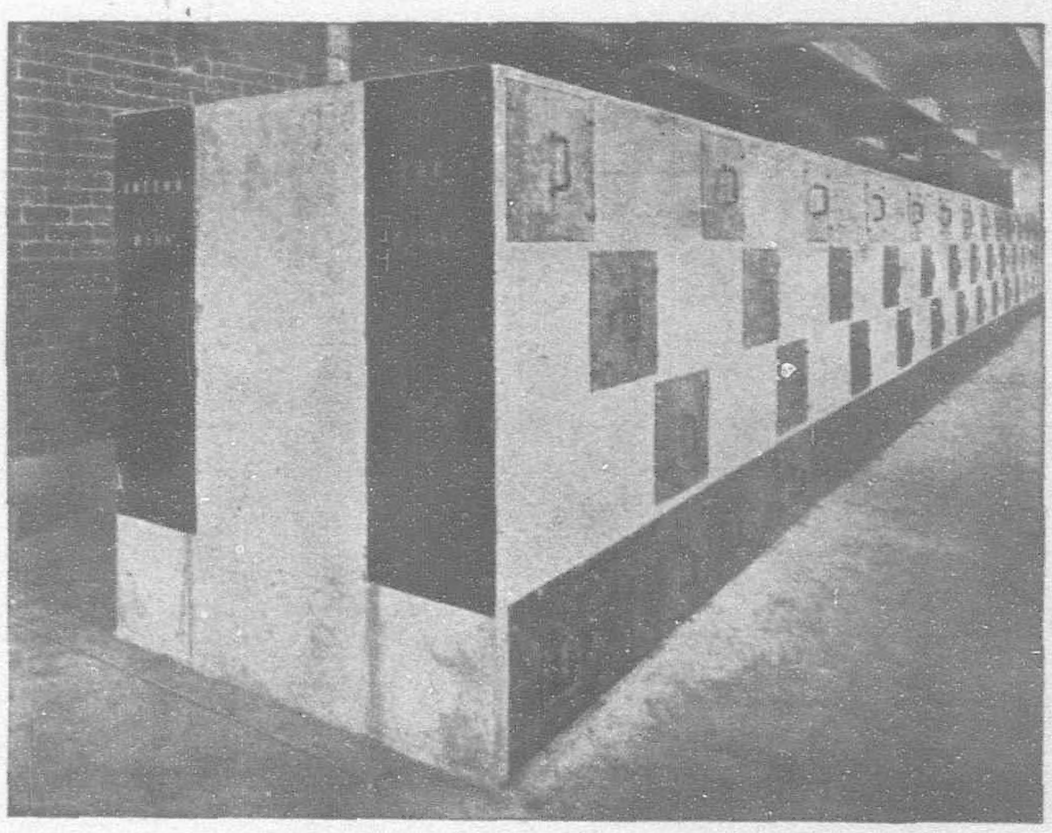

Fig. 12.—Cellular structure for main bus-bars.

head of oil ensuring rapid extinction of the arc on short circuits; and the fact that all live parts in the breaker are under oil, so that no arcing is possible between the metal work and the live parts. The breakers conform in every respect with Speification No. 166, issued by the British Electrical Standards Association. Appropriately coloured lights indicate whether the breaker is "on" or "off," while the tripping of the breaker on a fault is indicated by the usual bell.

The 500 volt steel plate cubicle board consists of ten panels in all, of which seven are for works supply. The remaining three are, (1) a 50 k.v.a. lighting panel; (2) a 50 k.v.a. panel for a charging set to which reference will be made later; and, (3) a bus-bar disconnecting panel. Each panel is equipped with oil circuit breaker and appropriate instruments. The breaker is in each case of a single tank pattern and direct operated.

While dealing with sqitchgear, it may be noted that at the Schoeman Street Station (the old generating station and now the chief sub-station) there is an electrically-operated stonework cubicle system which is a duplicate of that at the new power house; but in this case there are four feeder panels, a busbar panel and five panels for controlling the high tension side of the 750-k.w. motor-converters referred to in the early part of this article. The oil circuit breakers are of the same pattern as those described above. Also in the eight other Municipal sub-stations there are installed G.E.C. truck type cubicle switchboards for the high tension circuits, comprising in all some thirty trucks.

Reverting to the main power house, there is installed a petrol engine coupled by belt to a synchronous motor and also to a battery charging generator. The set can be used for battery charging or reversed to supply A.C. power; alternatively, in the event of a shut down, the petrol set provides power for the auxiliary motors for starting up again.

It will be of interest, before concluding this account of the undertaking, to place on record a few figures of interest :—

Present Output	..	1.25×10^6 units per month.
Maximum Load	..	4,050 k.w. (which can be obtained from one machine).
Power Factor	..	Unity (approximately).
Load Factor	..	40 per cent.

The coal burnt is unsaleable for other purposes, and consists of 50 per cent. peas and 50 per cent. fine slack, having a calorific value of 12,000 B.T.U. The pithead price of this mixture is about 1s. 6d. per ton, while 2 lb. of coal is consumed per unit generated, which gives a pithead price of 0.02d. per unit.

The total cost of the station was £250,000, including buildings, but exclusive of the dam and the land, this latter being already municipal property. This gives a figure of £25 per k.w., of which 10 per cent. was absorbed by transport costs. A further £75,000 was spent on the Converter Station and in mains. In connection with costs, however, it must be mentioned that these were based on 1921 figures, when prices were still rather high.

There are in all eight sub-stations belonging to the Municipality, while the most distant lamp is 8 miles from the station.

As an indication of the wide use made of electricity in Pretoria the consumption per head of white population is 300 units per annum.

New Bank Liner—The "Springbank"

On April 13, Messrs. Harland & Wolff, Ltd., launched from their Govan shipyard, the twin screw motor vessel *Springbank* (5,200 tons gross) for Messrs. Andrew Weir & Company (Bank Line, Ltd.)

The *Springbank*, which is a high class cargo vessel is 434 feet long by 53 feet 9 inches broad by 37 feet in depth and is classed 100 A.1. at Lloyd's.

The double bottom extends fore and aft, and is used for the carriage of oil fuel, fresh water, or water ballast. Seven bulkheads extend to the upper deck and divide the vessel into five cargo holds' motor room, and fore and after peaks.

The holds are fitted with cargo hatches of ample size, which are worked by twelve of the builder's steel derricks, each suitable for 5 ton lifts, and rigged in the best manner for the efficient handling of cargo.

The derricks are attached to two steel pole masts and four derrick posts, and an additional heavy derrick is fitted at the after side of the foremast suitable for dealing with loads up to 25 tons.

The *Springbank* will be propelled by two sets of Harland B and W, 6 cylinder 4 cycle motors, with electrically driven auxiliaries.